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PROCEEDINGS

OF THE

BATH NATURAL HISTORY

AND

ANTIQUARIAN FIELD CLUB.

VOL. VII.

BRITISH MUSEUM

BATH:
PRINTED (FOR THE CLUB) AT THE HERALD OFFICE, NORTH GATE.
1893.

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VOL. VII., No. 1.

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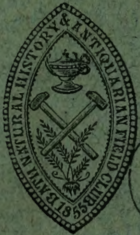

MUSEUM
NATURAL HISTORY

PRICE HALF-A-CROWN.

BATH:
PRINTED (FOR THE CLUB) AT THE HERALD OFFICE, NORTH GATE.
1890.

The Fauna of Bath, as illustrated by the Duncan Local Museum.

By G. Norman, Esq., M.B.

(Read March 13*th,* 1889*).*

The foundation of a local natural history collection for Bath was laid many years ago by the Brothers Duncan, in honour of whom the collection has been named.

It owes, however, its present value to the assiduous and untiring energy of the Rev. Leonard Blomefield, the venerable President of the Bath Field Club.

He anticipated by many years the recent recommendations of the British Association as to provincial museums generally, viz., that the purposes of science would be best served by the formation of collections as complete as possible of a local character, rather than by the accumulation of collections of a general character, which could be rarely rendered complete enough to serve any useful purpose.

Thus, in 1866, in a report of the Museum sub-Committee, he said :—"The Committee take this opportunity of drawing the attention of the public to the much greater degree to which the usefulness and efficiency of the Museum would be increased, if an endeavour were made to acquire, as far as possible, a complete collection of the animals of the neighbourhood of Bath. Local collections of this kind are not only what are of most value and interest to students of natural history in the district, but what seems to come more immediately within the province of a local establishment. . . . . It is hoped by making this statement to all friends of the Institution, that they will use their influence in obtaining for it specimens in illustration of the fauna of Bath and Somerset, which the Committee think would be preferable to any large increase in the foreign collections.

"These last, unless restricted to a carefully selected and well-arranged series of type-forms, representative simply of the larger groups, serve very imperfectly for the purpose of science or the instruction of the public."

With the view of continuing the good work carried on for so many years by Mr. Blomefield, the following notes are brought together as to the contents of the Duncan Local Museum, and by comparison with other local lists the strong points of the collection are brought out and the weak points can be seen, and it is to be hoped remedied.

Whilst, however, the desirability is here suggested of obtaining as complete a series as possible of the fauna of the district, a protest must at the same time be made against the indiscriminate and interminable slaughter of rare specimens. So long as every rare bird or animal is shot at or trapped, so long will it be the constant lament of the naturalist that more and more species are becoming extinct in our land. The two ideas are not incompatible, for the observations of the naturalist do not as a rule necessitate the destruction of life, rather they require the patient observance of the ways and habits of life, after the fashion of Gilbert White, of Selborne, and of Charles Darwin.

The fact that these notes were only put together as an attempt at forming a regular catalogue for the Duncan Local Museum, must be my excuse for their appearing very much in catalogue form. It is difficult to decide on what the limit of distance for a local collection should be, for whilst the radius taken by Terry, in his local lists of Bath fauna, extends only a little over six miles, there are specimens in the museum embracing a radius of twenty-five miles, extending as far as Weston-super-Mare on one side and Cliffe Pypard in Wiltshire on another. The majority of specimens, however, were taken within a radius of ten miles, and probably it will be best to keep to this.

MAMMALIA.

This is necessarily a small collection, but fairly representative of the district.

1.—CHEIROPTERA.

There is a very good collection of Bats, seven species being catalogued. The Greater and Lesser Horse Shoe Bats are found in hollows and caves on Hampton Rocks and in the quarries on Kingsdown; the Lesser Horse Shoe Bat is confined to the West of England.

The Kingsdown quarries are also the habitat of the Reddish Grey Bat (*Vespertilio Nattereri*), which is not recorded in the list published by Mr. Charles Terry.

The Whiskered Bat and the Pipistrelle are found in old shops and houses in Bath—the latter species is rare.

2.—INSECTIVORA.

The Hedgehog, Mole, and Common Shrew are all well-known members of this group—the Water Shrew is less common, one of the specimens in the museum has seven young with it. The Oared Shrew, in Mr. Terry's list, is simply a variety of the Water Shrew.

3. —CARNIVORA.

The Badger and Otter are now becoming rare, although formerly more common in the district than in other places.

The Badger was taken at Cold Ashton, the Otters on the Avon near Bath, and at Limpley Stoke; and a young specimen at Bathford bridge.

The Polecat is now very rare—the specimen in the museum was taken at Wick.

The Weasel and the Stoat, or Ermine, are still common, but there is a specimen of the latter in the museum, which is in its winter coat of nearly pure white, except the head; it was taken on Kingsdown in the winter of 1870.

The Fox is too common to need notice.

4.—RODENTIA.

The Squirrel, Dormouse, Long-tailed Field Mouse, and common

Mouse are all well-known, but there is no specimen of the *Mus Messorius,* Harvest Mouse, which is mentioned in Terry's catalogue. The Black Rat is now almost extinct, being replaced by the stronger brown Norway Rat ; the specimens of the Black Rat in the museum were obtained from old warehouses in Bristol.

The Water Vole, or Water Rat, and the Field Vole, or Short-tailed Field Mouse are common ; but there is no specimen in the museum of the Red or Meadow Vole.

The Hare and Rabbit need no mention.

AVES.

The Birds are the largest and perhaps the most interesting section. A ten mile radius from Bath embraces a great variety of country, including the valley of the Avon, and innumerable well-timbered valleys with small streams, open downs, old quarry grounds, numberless plantations and much underwood, thus affording habitats for a great variety of land birds. But in addition to this, from its proximity to the Bristol Channel and to the marshes of Somerset, the district receives frequent visits from water birds.

The following table will show the approximate numbers compared with other places :—

	LAND.	AQUATIC.	TOTAL.
British Birds (Yarrell, 1885) ...	199 ...	176 ...	375
Somersetshire (Cecil Smith) ...	115 ...	100 ...	215
Wiltshire (A. C. Smith)	133 ...	102 ...	235
Bath (Terry)	113 ...	46 ...	159
Bath (Museum)	91 ...	31 ...	122

LAND BIRDS. 1.—RAPTORIAL.

Besides the Owls, only two species of birds of prey are found in the museum, the Kestrel and the Sparrow Hawk, although Terry mentions several others, viz. : the Hobby, the Merlin, the Goshawk, three Buzzards, the Kite and two Harriers.

The Kestrel is the commonest and most harmless of the Hawks, although persecuted equally with the rapacious Sparrow Hawk; it feeds largely on ground vermin and coleopterous insects, thus benefiting the farmer, and although it feeds sometimes on small birds it very rarely attacks game.

Terry speaks of it as a summer visitant, but this only applies to the northern counties, for it is stated in Yarrell's fourth edition of British birds, on the authority of Professor Newton, that the southern counties receive an accession in the winter owing to migration from the north.

The Sparrow Hawk is much more destructive to poultry and game than the Kestrel, an instance of its extraordinary power in this direction being recorded by Mr. Knox, where fifteen young pheasants, four young partridges and five chickens, besides a bullfinch, two meadow pipits and two larks were found all in a fresh state stored up for the half-fledged young. There is a great difference in size and colour between the male and female, so much so, that they are sometimes mistaken for distinct species.

Of the other raptorial birds mentioned by Terry, only one has been heard of by Mr. Blomefield as occurring near Bath, viz., the Kite; a specimen of which was exhibited at an afternoon meeting of the Field Club, but unfortunately was not obtained for the local museum. The Rev. A. C. Smith considers the Kite almost extinct in England, although formerly very common; one was killed at Longleat in 1864.

Of the Owls, there are only four species in the museum, viz., the Barn Owl and the Tawny Owl, both common, and the Long-eared Owl and Short-eared Owl, both rare; the specimens of the Long-eared Owl came from Radstock and Mells, the Short-eared Owl from Warleigh, all in the years 1872-73.

Terry mentions the Scops-eared Owl and the Little Owl in his catalogue, but both specimens were shot in the year 1834.

The Owls were described so well by Mr. Williams in our Proceedings for 1885 that there is no need to refer further to them.

2.—PERCHERS.

Derive their name from the form of the foot which is perfectly adapted for perching or grasping, the hind toe being always developed.

This is a very large division in which is found a large proportion of our local birds; it is sub-divided according to the shape of the bill.

A.—WIDE BILLED.

So called from the enormous width of gape, taking food principally on the wing; feet not well developed.

The Swallow, Swift, Martin and Sand Martin are all summer visitants; the Nightjar, also a summer visitant, is the only nocturnal bird of this series, living on night-flying insects. It is occasionally seen in the Bath district, the specimen in the museum comes from Cliffe Pypard, Wilts.

Included in this series is the Kingfisher, whose brilliant plumage is not unfrequently seen along the banks of our river.

Terry mentions the Bee Eater, but the reference is uncertain, as the bird was only sighted near Old Widcombe Church in 1850.

B.— CLIMBERS.

Toes arranged in pairs for climbing, also stiff bristly tail to serve as support; extensile tongue for catching insects.

It is impossible to refer to all the birds in this group; so only mentioning the names of the Common Creeper, Nuthatch, Wren, Cuckoo and Wryneck we pass to the Woodpeckers.

The Great Black Woodpecker is denied by many ornithologists to be a British species, but the Rev. A. C. Smith reports one having been shot at Longleat many years ago, which is now in the collection of Mr. James Rawlence, Bulbridge, Wilton.

There are three Woodpeckers in the Museum, the Great Spotted, the Lesser Spotted, and the Green Woodpecker.

The Lesser one was shot at Batheaston, but there is no information as to the others.

The Hoopoe is generally included in this division, although not a climber. Cecil Smith ("Birds of Somersetshire") considers it very rare, not having seen one, but hearing of one being seen near Taunton, in 1866. Rev. A. C. Smith ("Birds of Wiltshire") mentions that a fine male was shot at Savernake in 1877, and another at Bowood in 1886.

Terry mentions one being shot at Weston, in 1850, but there is no specimen of the bird in the Museum; several members of the Bath Field Club, however, testify to having seen the Hoopoe in the suburbs of Bath on one or two occasions.

3.—CONE BILLED.

So called from the conical form and immense strength of the beak; this is a large division, including the Crows, Finches, Buntings and Larks.

All the Crows mentioned in Terry's list are in the Museum, except the Chough, viz., the Raven, Hooded or Royston Crow, both rare, the latter being shot at Tadwick, the Carrion Crow, Jackdaw, Rook, Magpie, Jay and Starling. As to the Chough, Terry says one was caught at Bathwick, in 1831, but both the Smiths agree that the bird is extinct in our home counties, although the sign of the "Three Choughs" at Yeovil would seem to indicate that the birds had once been common there.

Cecil Smith says that the Choughs seem to have a natural antipathy to Jackdaws, and the latter being the hardier birds have probably supplanted them.

Of the numerous Finches, Buntings and Larks, we have a good collection, embracing all the species mentioned by Terry except the Mealy Redpole and the Pine Grosbeak, neither of which are mentioned in the "Birds of Somersetshire or Wiltshire." The Snow-bunting is a not unfrequent straggler here, but is by no means a regular winter visitant; the specimen in the Museum, in winter plumage, was shot at Tormarton in January 1881.

4.—TOOTH BILLED.

The beak has a distinct tooth or notch near its extremity, enabling the bird to hold its prey securely.

This is a still larger tribe than the previous one, embracing the Butcher birds, Fly Catchers, Thrushes, Warblers, Titmice, Wagtails, &c.

Here again our Museum is fairly strong, having all the specimens mentioned in Terry's list except the following:—The Great Shrike, the Dipper, the Reed Warbler, the Fire Crest, the Yellow Wagtail, the Wax Wing and the Pied Fly Catcher.

The Museum possesses a specimen of Ray's Wagtail, not mentioned in Terry's list, and Mr. Blomefield mentions that a specimen of the Black Redstart, a very rare bird, was shot near the Viaduct, Limpley Stoke, at Christmas 1881, but he was unable to obtain it for the Museum.

The Great Gray Shrike and the Pied Fly Catcher, mentioned by Terry, are both rare birds in England.

The Dipper, or Water Ouzel, used to be not unfrequently found in Somersetshire and Wiltshire, but it has been so persecuted by gamekeepers, under the mistaken idea that it feeds on the spawn of fish, that it has become rare. Although we have two nests and eggs of the Water Ouzel in the Museum, we have no specimen of the bird itself.

GROUND BIRDS.

Amongst these are included the Doves, Pheasants, and Grouse. Of the Doves we have all four species mentioned in the "Birds of Somersetshire and Wiltshire," viz., the Ring Dove or Wood Pigeon, the Stock Dove, the Rock Dove, and the Turtle Dove; in Terry's list the Stock Dove and Rock Dove are not mentioned, although not uncommon.

The Rock Dove is interesting as being the true wild pigeon, the ancestor of all the numerous varieties of the Domestic Pigeon, as is so fully explained by Darwin in his works. A large case in the central hall of the Natural History Museum at South Kensington well illustrates this matter. The specimen of the Rock Dove in the Museum was shot at Dyrham.

There is no need to dwell on the Pheasants, Partridges or Quails. The Red Legged Partridge, mentioned by Terry as local though rare, is not mentioned by Cecil Smith in the "Birds of Somersetshire," and is recorded by the Rev. A. C. Smith as found rarely in Wiltshire. The specimen in the Museum was shot at Cliffe Pypard, in Wiltshire. It is not a bird to be encouraged, as it drives away its more valuable congener, and the flavour of its flesh is not to be compared with that of the ordinary Partridge.

One interesting group of birds belongs to this order—the Bustards. Cecil Smith mentions that he could find no record of them in Somersetshire, but Mr. Blomefield, in a paper read before the Field Club in 1872, speaks of a flock of Great Bustards having appeared near Barnstaple, in the winter of 1870, whence they dispersed over the adjoining counties, one being found at Shapwick, in Somerset. It was during the same winter that the last Bustard was seen and shot on Salisbury Plain, once the greatest resort of these birds in Britain.

There is no local record of this bird, although Cecil Smith considers it probable that it once had a habitat in the high open ground of the Mendips between Bath and Wells.

WATER BIRDS. 1.—WADERS.

The Waders occupy a middle space between Ground birds and true Water-fowl, embracing Plovers, Cranes, Herons, Snipe, Rail, &c.

Distinguished by length of legs and neck, and admirable developement of feet for wading on soft mud, or running lightly over aquatic plants. Of the Plovers, we have in the Museum specimens of the Lapwing, Golden Plover, Ringed Plover, and Oyster Catcher; the Ringed Plover is not mentioned in Terry's catalogue.

The Lapwing, Crested Lapwing, Crested Plover, or Peewit as it is variously called, is found in abundance on Lansdown, where it breeds in the spring.

The Golden Plover is an occasional winter visitor; there is a change in plumage between winter and summer. The specimen in the Museum was taken at Combe Hay in the winter of 1881.

The Ringed Plover is a great frequenter of the sea shore, and is not so common inland; numbers of them congregate on the mud foreshores at Weston-super-Mare and Burnham. The bird is conspicuous for a distinct black and white band around its neck. The specimens in the Museum come from Warleigh, through the kindness of H. D. Skrine, Esq.

The Oyster Catcher is still more of a salt water bird, and the specimen in the Museum comes from Weston-super-Mare.

The Heron should be seen on our river more frequently than it is considering there are heronries at Bowood, Longleat, Fonthill, and several other places in Wiltshire, and at Brockley Woods, in Somerset.

The Bittern, although mentioned by Terry as having been shot on Lansdown in 1857, seems becoming one of the rarer birds. One was killed at Bradford-on-Avon in 1875, another near Frome in 1883, and one near Trowbridge in 1887; there is no specimen in the Museum.

The Common Curlew, although abundant on the mud flats of the Somerset coast, is only occasionally seen on our downs. The specimen in the Museum is from Weston-super-Mare.

The Common Sandpiper is a regular summer visitor to our streams, and occasionally found on our downs; it is a very active and elegant bird, able both to swim and to dive. The pair in the Museum were shot at Bathampton.

The group of Woodcock and Snipe, all winter visitants, are becoming increasingly rare. The Woodcock in the Museum is from Dyrham, and the Jack Snipe, the rarest species, from Warleigh. The eggs of this bird are of greater bulk relatively to its size than those of any other bird, for the bird weighs about 2 ozs. and its four eggs more than 1½ oz.

The Grey Phalarope, the Whale bird, belongs rather to ocean than to land, and is at home within the Artic circle; it became very abundant throughout England in the autumn of 1866, during a period of very heavy weather. The specimen in the Museum was shot on Midford Ponds in October 1870. We have a fair collection of the Rails, which are not uncommon in our district, although difficult to observe on account of their shy and retiring habits.

The specimen of the Spotted Crake was picked up dead on the railway between Bath and Kelston in October, 1881; it was supposed that it flew against the telegraph wires, as there was a deep cut across its breast.

Terry mentions a Water Rail and a little Crake as having been shot in the pond at the back of Grosvenor, but gives no date. The Common Coot was obtained on the river near Keynsham.

2.—SWIMMERS.

Boat shaped bodies and webbed feet attest their remarkable powers of swimming and diving.

A large proportion of these birds have the ocean as their habitat, and, therefore, can hardly be claimed as local. Still some are frequenters of our streams, and, with regard to the others, as it is the custom to include in the list of birds of a district, all species whether occasional visitants or mere stragglers driven out of their way by stress of weather, we must follow the usual custom.

Amongst the Ducks we have local specimens of the Teal, Common Scoter, Pochard and Golden Eye.

The Teal, the smallest and most beautiful of the Ducks, is tolerably common as a winter visitant; the specimen in the Museum was shot at South Wraxall in December 1875.

The Tufted Duck, also very ornamental, was killed at Warleigh during the winter of 1870, whilst the Common Pochard was killed on the Avon near Newton.

The Golden Eye is a much rarer species, and does not breed in England. The specimen in the Museum is from Freshford.

The Common Scoter is a still rarer bird as an inland visitor, although numerous at times on the Devon and Cornish coasts. There are only one or two notices of its appearance in either Wilts or Somerset. Although thoroughly at home in the heaviest surf, it cuts but a sorry figure on land. The specimen in the Museum was seen to fly against a garden wall in S. James's Square in April, 1869; it broke its wing and was picked up by a man at work close by.

The Little Grebe or Dabchick is with us all the year round, but, on account of its shy retiring habits, it is not often caught sight of on our rivers and pools; of the two specimens in the Museum one was taken on the river side at Grosvenor, the other at Newton Bridge.

The rest of the birds to be mentioned are entirely sea birds.

The Red-throated Diver has only been noted in Wilts and Somerset either in a thoroughly exhausted condition, or else dead, from long contending with heavy weather. The fine specimen in our Museum was picked up in The Cloisters alive and uninjured, but thoroughly exhausted, during a furious gale in October 1881; the measurement from tip to tip of its spread wings was three feet six inches.

The two Gulls, the Blackheaded Gull and the Kittywake, were obtained respectively at Warleigh and Kelston; the other Gulls, also the Razorbill, Guillemot, and some others, were obtained at Weston-super-Mare, and are, therefore, not strictly local.

This concludes the notes on the birds of our Museum, and any observations on the reptiles, fish, and lower forms, such as the land and fresh water shells, insects, &c., must be left to some future occasion.

Lecture on some Peculiar Odours common in certain instances to both Animals and Plants. By the Rev. L. BLOMEFIELD, M.A., F.L.S., F.G.S., *President.*

(Read December 18*th,* 1889.*)*

It is not my object in this lecture to treat of all the various smells emitted by animals and plants, but simply to draw attention to a few cases in which there are peculiarities deserving, I think, of more thoughtful consideration than they have hitherto received from naturalists, and leading to questions of great interest. I will at once enter upon the subject. You know the smell that hangs over a menagerie of wild beasts, lions, tigers, &c; you know the smell of a flock of sheep packed closely in a fold; or of a stable full of horses; or that of a pigstye; or a basket of fish. To pass to the vegetable world:—You know the smell of a bed of roses or violets, and I dare say you know the smell of a bed of nettles, and the difference between them and the roses, and so of other flowers; some being cultivated exclusively for their scent, the flower itself being insignificant, as in the case of the mignionette; of fruits also—you know the smell of a strawberry, a peach, or plum, apple, &c. All these things emit odours, well known and not easily mistaken for others.

Now would you not be much surprised, if—on a person presenting you with a large handsome flower as attractive in appearance as a rose—you put it to your nose and found it smelling like a fox? This is an imaginary case; but I proceed now to speak of some analogous cases that have a real existence in nature. I dare say most of you are acquainted with the *musk* plant, so common at the present day in gardens and houses. Originally from N. America, it has become quite naturalised on the banks of some of our rivers, though not to my knowledge found in Somerset. It smells so strong of musk, that, when planted in window boxes, its odour sometimes pervades a great part of the house.

Now do you know what the real musk, the musk of commerce, is? It is a peculiar substance secreted in a bag attached to the under part of the body of the male Musk Deer, an animal allied both to Deer and Camels, found in Tibet and other parts of Asia. How strange that a plant in North America should have exactly the same smell as a certain part of an animal inhabiting the direct opposite side of the globe. But so it is. Let us pass now to some other cases scarcely less remarkable, especially that of the "Hound's Tongue" *(Cynoglossum officinale)*, a plant not very uncommon on waste land in the Bath neighbourhood. Were I to put this plant under your nose, your eyes being shut, and then suddenly taking it away, to dangle a dead mouse before your nostrils instead, you would not know the plant had been removed, so extremely like the smell of mice is the smell of that plant.

A third case I would call your attention to is that of the *Allium* tribe—onions and garlic—and as my experiences in this instance, as indeed in the last mentioned also, have been gained in our own neighbourhood, I consider there is quite sufficient sanction for bringing the whole subject, with which they are connected, and of which I am about to treat, under the notice of the Bath Natural History Field Club.

It was during my residence at Swanswick that, on the occasion of my walking one day up the lane leading from Larkhall to the Gloucester Road, I perceived a strong smell of garlic. I looked about, and then noticing several plants of the Broad-leaved Garlic *(Allium ursinum)* on the grassy banks each side of the road, the matter was explained, and I thought no more about it. Some time after, however, when walking by the side of another grassy bank, also near Bath (the exact locality I forget), I experienced the same strong smell of garlic, and quite expected to find as before the same *Allium ursinum* growing somewhere in the hedges; but not a plant of it was to be seen. On lowering my head, I then ascertained that the smell did not come from any plant at all, but from a small snail, which was crawling in considerable numbers upon the grass, or lurking near the roots. On holding one of them to the nose the smell of garlic was quite as strong as in the plant above spoken of.

This snail is the *Zonites alliarius* of Conchologists, taking its name from the peculiar odour which it emits. It is somewhat local but not very uncommon. It is well described in Jeffrey's "British Conchology,"* and I will state what he says about it, his experiences having been much like my own. He says, "This "snail has a very strong pungent smell of garlic, especially "when irritated, and I have perceived it at the distance of "several feet from the spot. Having found living specimens "under stones in a bed of wild garlic, I thought first they might "have fed on this herb and thus acquired the peculiar odour; but "I afterwards observed that this scent was quite as powerful in "specimens collected on an open down where there was no "garlic."

And there is a further point of much interest in the case I am now speaking of. This odour of garlic is not confined to the plant or to the snail; it is found also in a mineral. I allude to the well-known arsenic, the basis of which is a peculiar metal, sometimes met with in its pure metallic state, though more commonly combined with other metals. If heated to 356° Fahrenheit, it is volatilized, without previous fusion; the vapour has a strong smell, resembling that of garlic, and this (it is said), "to a certain "extent is relied upon as proof of its presence."†

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* Vol. i., p. 182.

† *Penny Cyclopædia*, vol. ii., p. 400.

I have now to bring under your notice another case, perhaps more remarkable than any yet mentioned, that of the *Stapelia hirsuta*, or Carrion flower; one of a large genus of African plants, most of the species being natives of the Cape of Good Hope. They are succulent plants without leaves, frequently covered over with dark tubercles, giving them a very grotesque appearance. The flowers are large, of various colours, but in most instances give off very unpleasant odours. The corolla of the *S. hirsuta* is of a dark chocolate crimson colour and very large, the whole flower having somewhat the appearance of a good-sized rose. "The smell is said to be so like that of carrion, that flesh-flies "actually come and deposit their eggs in the flower. When the "maggots are produced, they wander about looking for food "which is not there, and are starved for the want of it."

Surely nature is in fault here—some might be inclined to say; charging her with the neglect of her own offspring and suffering them to be starved in this way. But science is not concerned with final causes. She is not called upon to say why things are permitted thus to be, but simply to investigate and explain, if possible, from what causes such phenomena may have arisen in the first instance.

This is not in the present case an easy problem to solve; but I see no reason why we should not attempt the solution of it. On mentioning some of the cases above spoken of to one of our first botanists in this country, he seemed inclined to push the question aside altogether, as one that could not be answered and was not worth considering. But it was not so in the case of two other botanists, also of high reputation—one Professor of Botany at Cooper's Hill, the other a reader in Botany at Cambridge—both, too, well up in Physiological Botany. These gentlemen were together at my house one day during the week of the meeting of the British Association, at Bath, last year, and I brought this subject before them in conversation. It was a question quite new to them, they had never considered it, but they thought it one of great interest though difficult to explain. After a time, one of them suggested—a suggestion that had before occurred to myself—that this similarity of odours in the animal and vegetable kingdoms greatly supported the belief, very generally held by naturalists of the present day, that the two kingdoms had sprung from a common source. And certainly it is a fact the lower we descend in the scale of life, the more nearly they approach each other in their organisation, until we arrive at such an extreme simplicity of structure as renders it hardly possible to say whether it be animal or vegetable.

But what if we find an *in*organic substance having the same odour as an animal and a plant? I have mentioned above one such substance—viz., the metal arsenium; and may we not draw the same inference here as before? If the circumstance of any particular odour being found alike in an animal and a plant leads to the belief that the animal and vegetable kingdom originated from one source, does not the circumstance of the same odour occurring in a mineral favour the belief that all the three kingdoms—animal, vegetable, and mineral—were united at bottom before they advanced on their respective lines of further development? This is in effect as much as saying that formerly, before the varied productions of this earth had taken shape, even before life had begun to exist, or at least to manifest itself in any distinguishable form, *matter* existed, but in such an elementary state as to give no sign of what was afterwards to arise out of it.

And now let us proceed to the question—what are these odours? Looking to their first origin, we may suppose them to have arisen from the interaction of such particles of matter as spoken of above, according to their polarity* and environment; chemical affinities also coming into play, from time to time, as we see in the chemist's laboratory—in the case of colours.

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* "Atoms and molecules are endowed with definite, attractive, and repellent poles."—*Tyndall.*

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In respect of the circumstances under which they now affect our olfactory organs, they are exhalations from the several substances that produce them, whether organic or inorganic, consisting of inconceivably small particles of matter, the quantity and quality depending, in some measure, on the temperature of the bodies from which they emanate, while the distance to which the odour is carried would depend upon the state of the wind that wafts them about. This distance is sometimes very remarkable. Darwin speaks of the air being "tainted over "miles of space by certain offensive animals and yet strongly "affecting the olfactory nerves."*

And with this last remark I might end what I have to say in immediate connection with the title of this paper. But the subject to which it relates, bound up, as it is, with the proved existence of matter in its simplest state—so microscopically small as to be hardly made known to us except when arising from odoriferous substances; bound up also with the fact of living germs in the air being almost everywhere mixed up with the material particles, leads me on irresistibly to the consideration of a question of the deepest interest and importance; viz., the question as to the origin of life on this earth?

I stated above that before our earth, with all its varied productions, had taken shape, matter must have existed, though in its most elementary state; indeed it has been recently stated by high authority that "in atoms we have something which has "existed either from eternity, or at least from times anterior "to the existing order of nature."† There must also have been from the beginning the living germs themselves, from which—according to the teaching of evolution now so generally accepted—were to be evolved in after ages all the various forms of animal and vegetable life we meet with at the present day. Now the remarkable thing is this—these same germs or similar germs of equally simple structure, still exist at the present day. What is their past history? What is their future destiny? Go almost anywhere, we find them in the atmosphere, mixed up with more or less of dust and other extremely small particles of matter. The dust is easily explained. It comes from the wear and tear, as also from the decomposition, of all the various substances, organic or inorganic, existing upon the globe. The motes we see in a sunbeam are specimens of this dust; and it is observable that wherever this dust exists, there also we find the above microscopic germs, the harbingers—or first forms—of life, waiting, as it were, to take a higher grade of existence according as circumstances favour such development or not. The dust in the air spoken of above is most abundant (as might be expected) in large towns; in the open country it is much reduced in quantity; it is still further diminished by the sea shore, where it lies open landwards and away from houses, and in the midst of a wide ocean it scarcely exists at all. And all this may be said in like manner of the microscopic germs of life. In fact the dust and the germs go together.*

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* "Variation of Plants and Animals," vol. ii., p. 403.

† See the new *Encyclopædia Britannica*, Art. *Atom.*

These microscopic germs are the *microbes* of Pasteur, that distinguished French experimentalist of whom we have heard so much lately, and who has proved them to be the source of so many of our infectious diseases as well as accidental maladies. They are inconceivably minute. Huxley says that if one of them measured only the thousandth part of an inch, it would be a giant among its fellows.† The writer of the article *Atom*, in the "Encyclopædia Britannica" before alluded to, says, "That

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* The above remarks on dust are grounded on experimental researches made by an observer, and published; but I am unable to refer to the original authority.

† Letter to the Lord Mayor on Pasteur's researches. See *Nature*, vol. xl., p. 225.

"the smallest organised particle visible under the microscope "contains about a million organic molecules." This I believe to be a mathematical calculation which I could not, and need not, enter into here. The question I wish to consider is—Whence come these germs? Darwin has stated his belief to be, that all the various forms of life we meet with in the world at the present day have been evolved, during the lapse of ages, from a few primitive germs; but he says nothing about the germs still existing *as germs* everywhere about us. That some of these develop into slightly higher forms is almost certain; for we may sometimes trace the changes they undergo by watching them from day to day under a powerful microscope. But what of the simplest and lowest forms, mere specks of protoplasm, which as far as we can see have not as yet undergone any development whatever. One of two things must be the case. Either they have remained *in statu quo* from the first creation day—strange and hardly imaginable—or they must have been brought into existence since. Which, think you, is the most likely? My own impression is that the same condition of things, or the same surroundings—environment, as sometimes called—that favour from time to time the passing of these germs from a lower to a higher form may have favoured their start into life in the first instance.* I only put this forth as a conjecture. Of course it cannot be proved; and many may think there is little or no ground for the supposition. But remember, gentlemen, we are

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* Since the above was written, I find a paragraph in Wallace's "Darwinism" bearing on this very subject. It is headed "The "continued existence of Low Forms of life." His view of the question is that, "probably, these low forms occupy places in nature which "cannot be filled by higher forms, and that they have few or no "competitors; they therefore continue to exist."—*Darwinism,* p. 114.

This is plausible, and may explain the difficulty in part. But it leaves the question as to the origin of the germs quite untouched. I see no occasion, therefore, to alter anything I have said above here dealing with living molecules of such extreme minuteness as to defy all attempt at either measurement or analysis. We know nothing positive as to their origin : we are left to conjecture only, or to speculation if you like to call it so. And why should we not speculate? When did science ever make any advance towards the solution of its more recondite problems without speculation in the first instance? Take the following case. A phenomenon occurs to an observer of quite a novel character, such as he had never before witnessed. He naturally sets himself to consider what can have occasioned it? Difficulties are thought over until the mind suggests a possible way out of them. Facts are then sought for bearing on the subject in question, in order to confirm or negative his first speculation, which in the end is accepted or cast aside as the case may be.

Of course on such an obscure question as that of the origin of life, there will be difference of opinion; but the more the question is thought over and discussed, the sooner are we likely to find the right answer to it.

Some of our most distinguished men of science at the present day believe in the closest connection between life and matter. Herbert Spencer believes that "life in all its forms has arisen by "an unbroken evolution through the instrumentality of natural "causes."* Huxley, in his well-known article in the *Fortnightly Review*, on the "Physical basis of Life,"† published many years back, considers "matter and life inseparably connected." He regards the matter of life as "composed of ordinary matter, "differing from it only in the manner in which its atoms are aggregated." Tyndall enquires—"Divorced from matter where "is life to be found? Trace the line of life backwards, and see it "approaching more and more to what we call the purely physical "condition."‡

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* See *Principles of Biology*, vol i., pp. 483-4. † No. xxvi. New Series.

‡ Belfast *Address to the British Association*, 1874.

Persons may not be disposed to accept, or science able at present thoroughly to confirm these statements. But life must have been infused into the gelatinous specks I have spoken of above at some time or other, and in some way or other; and science in its latest utterance on the subject has pronounced the answer to the question—What is life? "to be approachable." I allude here to Burdon Sanderson's "Address" to the Biological Section of the British Association at the late Newcastle-on-Tyne meeting. It should be stated, however, that this was said in sole reference to the Physiological aspect of the question, and without consideration of any possible higher causes of life. But I do not see why (in the present instance) we should not bring the latter into consideration also, if the inquiry be made with reverence and in humility. And it is not a little remarkable that, almost at the close of his Article "on the Physical Basis of Life," Professor Huxley—perhaps the last man from whom we might have expected any leaning whatever towards spiritualism—has put on record that "in itself it is of little moment whether "we express the phenomena of matter in terms of spirit; or the "phenomena of spirit in terms of matter." I accept this alternative, and—believing all things to have had their beginning from that Great First Cause revealed to us as "*a spirit*"—I conceive that everything must have received therefrom more or less of a spiritual impress, left to be acted upon from time to time by outward causes, and so made capable or not of further development according to circumstances. The "matter or spirit" of Huxley might remain a material atom for ever; or be quickened into life if favoured by its surroundings. In the first case, it might along with other atoms become in the lapse of ages aggregated into large rock-like masses such as we see at the present day; in the latter the organisation would be so rudimentary in the first instance, whatever it might become afterwards, as to show no distinction between animal and vegetable.

And now, bearing in mind what has been said, let us—in conclusion—revert to the subject with which we set out. I brought before you a few instances only in which there was a singular identity of odour as regarded certain animals or animal substances, and certain plants. In one of these cases the same odour that arose from an animal and a plant, was found to proceed from a mineral substance also. We can hardly suppose that these instances stand alone in the world. Far more likely that there are hundreds of such cases—confining ourselves to animals and plants alone—that have never been noticed, or never duly reflected on by naturalists.

And I think we have a clue to the explanation of this anomaly in the conception of there having been formerly (throughout, it may be, all space and time) a commingling of such atoms as would favour, according to circumstances, the similarity or dissimilarity of whatever forms of life the evolution of after ages might cause to arise on our earth, not merely as regards the odours they emit, but in respect of all their other characters.

POSTSCRIPT.

Since this paper was written the November Number of the "Nineteenth Century" has come under my notice, in which there is an Article by Norman Lockyer, one of the highest authorities in this country in spectroscopic work as connected with celestial phenomena. It is headed "The History of a Star," and very shortly after commencing his subject, and stating what results had been obtained by spectroscopic observers of late years in determining the constitution of the sun, planets, nebulæ, &c., he comes to this general conclusion, "that if the study of "*meteorites* be conjoined with that of the heavenly bodies, the "story told by the spectroscope enables us to go a step further, "and to say that not only have we the same matter everywhere, "but all celestial bodies, including the earth, are due to an exquisitely simple evolution of matter in the form of meteoritic "dust. We have no longer to rest content with the *fact* that all "matter is one chemically; we have the cause."*

Further on he asserts that this "infinitely fine dust, finer "probably than anything we can imagine, becomes at last, in the "celestial spaces, agglomerated into meteoric irons and stones "with which the earth is being continually bombarded." He actually speaks of the number of such masses which fall upon the earth every day as exceeding twenty millions.

Now this subject of meteorites, and meteoritic dust, is not—as some of my hearers might suppose—altogether foreign to the question we have been considering. For, a few years back, one of our most distinguished physicists (I think it was Sir W. Thompson) threw out the suggestion that possibly life had been introduced into our world by a meteor, which in its flight through the celestial spaces had been arrested by our earth. But if meteoric dust is continually being poured down upon the earth, as would seem to be the case from what Norman Lockyer says, surely it is far more likely (germs and dust being, as we have seen above, so generally found together), that fresh life is being brought to our earth every day—silently—and without our knowing anything about it.

Moreover, I conceive that statements of this kind, by so eminent an observer as Norman Lockyer, go far to warrant much that I have said in the latter half of my paper, which might otherwise have appeared strange, as well as novel, to some of my hearers.

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* "Nineteenth Century," Nov. 1889, "History of a Star," pp. 786-7

Bath Old Bridge and the Oratory thereon. *By* EMANUEL GREEN, F.S.A.

(Read 15th January, 1890.*)*

The subject title here seems to divide itself into two parts, the Bridge and the Oratory, but for the present purpose these must be treated together as one.

Although in early times Towns and Cities had their bridges which they kept in repair it was not so with outlying places, as a bridge might be seized by some powerful lord to the detriment or cost of all travellers. Fords too were equally liable to this trouble. Thus the question of the origin of early bridges is of interest as possibly leading to a knowledge of some curious point or episode in local or personal history. Any very early notice however can only be met with by chance. The Saxon Chronicle tells us that after his attack on London, A.D. 1013, King Sweyne went " westward to Bath and sat there with his force." To him came the western Thanes and submitted and gave him hostages. Whether the Thanes crossed the Avon by a bridge or by a ford the Chronicle is not minute enough to tell us.

In A.D. 1138, when Bath was attacked in the time of Stephen, no mention is found of a bridge. Certainly this may be because the attack came from Bristol, and consequently the approach was not from the south or by the river.

Again, Richard of Devizes, who was a Friar of Witham A.D. 1192, records certain instructions given by a French Jew to a boy he was sending to England. When advising him as to the desirability or advantages of certain English cities for residence, he says, "Bath is placed or rather buried in the lowest parts of "valleys, in a very dense atmosphere and sulphurous vapour, as "it were at the gates of hell." There is no intimation of any bridge as an approach.

On making a reference to the History of any city or town it will be found that the writers say little or nothing of the bridges;

necessarily so, because nothing was known about them. Yet notwithstanding, bridges and bridge building were matters of public importance, and of general taxation from which no one could be excused. Ducange mentions a Guild of Bridge builders known as Fratres Pontis, the habit worn being white with a cross of cloth on the breast. Licenses for pontage, *i.e.* a duty paid on all articles carried across a bridge, can be occasionally found for other cities, our neighbour Bristol for instance, but there is not one for Bath, this arising from the fact that the bridge did not communicate directly with, or form actually a part of, the city. Being now in the position of other writers, having but little to say, a few words of criticism on what has already been said may first perhaps help towards correctness for the future.

First then, quoting the History of Bath printed in 1798 which goes under the name of Collinson, although for a great part of it we must be indebted to Edmund Rack, on p. 35 it is said of the suburbs of the ancient city,—"without the South Gate a street "called Horse Street leads to St. Lawrence Gate and Bridge over the Avon." There is no mention here of a chapel, but, relegated to a foot note there is added, alluding to the name of the bridge,— "so denominated from a small chapel built upon one of the piers "and dedicated to St. Lawrence. The chapel was a kind of "Oratory having a small recess for an altar at which a priest "celebrated mass and received the donations of passers by." Under the parishes of Lyncombe and Widcombe there is further added,—"the bridge was formerly narrow and incommodious, but "in the year 1754 was almost entirely taken down and rebuilt." No references are given as is so often the case in this work, and it may be seen that the statements generally are only such as any one may hastily imagine even if knowing nothing of local circumstances. The story is wrong then as to the saying of mass in the Oratory and a priest attending to receive donations. Such a place was and could be, little more than a niche, unprotected and unenclosed. The recess noted, if it ever existed, would be simply the resting place of some painting or for the image of a saint. There could be no altar in such a place and mass could not be said save at a consecrated altar. Thus in 1317, the Rector of Weston in Gordano was excommunicated for so doing. (*Bishop Drokensford's Register.*—Hobhouse—p. 128.) This little shelter, not large enough to be a chapel, was too deeply recessed to be called a niche and would thus be better described as a housing, a word found in early writings; or better still for our own information, to dissociate the idea of a chapel, an Oratory, a place for a passing prayer. Rack might have taken his notion from an earlier author, as Aubrey of Wiltshire, writing of Bradford says, here is a strong and handsome bridge, in the midst of which is a little chapel "as at Bath "for masse." A double meaning may be got here, first that the chapel was the same as that at Bath, and that, as mass was said at Bath therefore it was said at Bradford. The intention however we may feel sure was simply one of comparison. Bradford bridge is larger than was the one at Bath and although the present superstructure on Bradford bridge representing the chapel may not be quite on the same lines for size as the original chapel, the original was but a housing somewhat larger than that at Bath.

Taking next Warner, whose History must have been in progress at the same time as Rack's and even far advanced, as it was published in 1801 only three years later, on p. 210 writing of the Avon he says, "at the southern end of the city this river is crossed by St. Lawrence Bridge. This was built in 1754. It occupies the site of a very ancient but incommodious bridge which was formerly covered with houses and adorned with a chapel dedicated to St. Lawrence." Warner here in his desire to add to former accounts falls into further error, the result possibly of careless reading. First, to avoid confusion, it may be noted that St. Lawrence bridge was destroyed, not built, in 1754; the later bridges have no dedication. There were no houses on this bridge. Warner's authority for his assertion, a piece of information it must be remembered not given by Rack, must presumably be John Wood. Wood says, vol. ii. p. 326, as printed in 1749 five years before the Bridge was destroyed, "St. Lawrence bridge consists of five arches. The top of the bridge is 11 feet 6 inches broad over the arches, but much wider over the butments, and the buildings fronting it are the small chapel of St. Lawrence elevated over one of the piers and four dwelling houses erected on the banks of the river by the side of the butments of the bridge. The narrowness of this bridge is now become a public nuisance." We have here all that either Rack or Warner knew of the subject although they do not acknowledge it, and it can be noted how Warner's attempt to elaborate caused him to err. Wood wrote from personal knowledge, and in using the word butment he does not mean buttress or pier as Warner probably chose to read it, but the land wall on either shore on which the last arch of the bridge on either side rested. The greater width then over the butments means that the shore ends widened out, and the houses were, as indeed Wood plainly says, "on the banks of the river by the side of the butments." The chapel, he says as plainly, was on one of the "piers." Thus there is no intention to convey the idea that any houses were on the bridge; indeed with a width of eleven feet six inches only there could be none.

By good fortune we have preserved for us in the British Museum, two drawings of the Bridge as made by Bernard Lens in 1718. Bernard Lens, the son of Bernard, a Belgian, was born in England and was the second of four who bore the same name. He died in 1725. His especial excellence was work in Indian ink, the material used for these two exquisite sketches now reproduced. The views one from the east, the other from the west, give us a complete idea of the structure almost as fully as if it were before our eyes to-day.

Warner says, but again Rack does not, that in 14 Edward iij,

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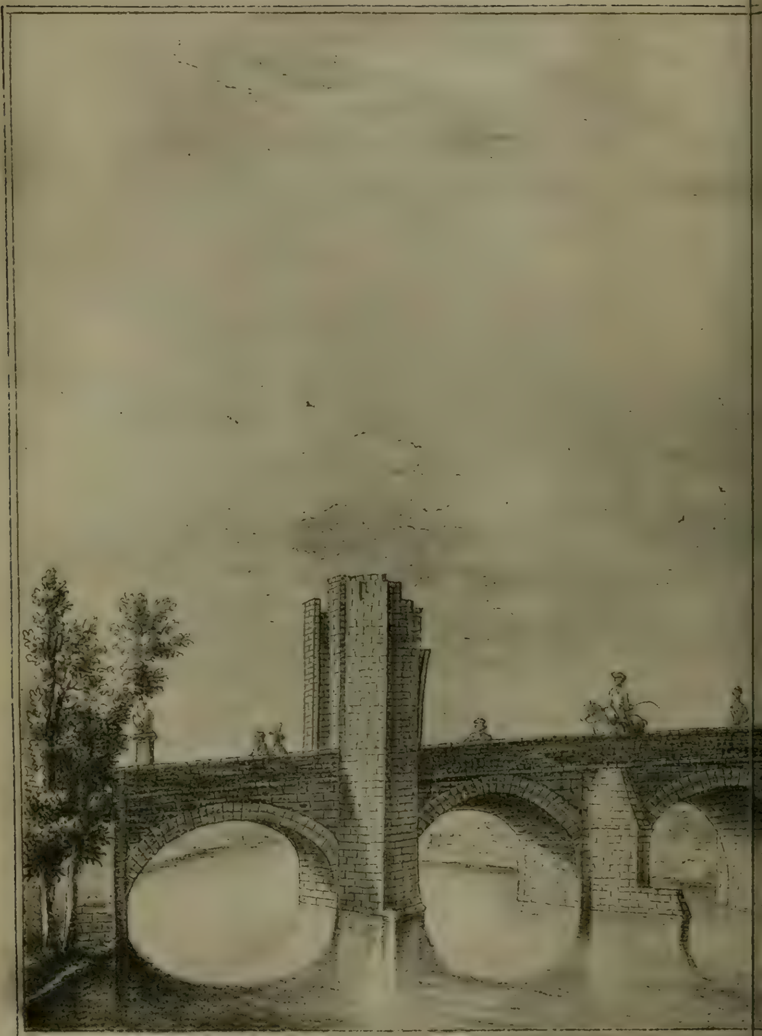

An East View

BERNARD LENS DEL: 1718

Bath Bridge

W GRIGGS, PHOTO-LITH.

which would be A.D. 1340, "the bridge across the Avon was erected to avoid wading a ford a little above it, hitherto the common passage;" adding further that this especial inconvenience had been more marked since the grant to the Priory ot Lyncombe fair in A.D. 1304. Besides the absurdity of wading through water to get to a fair, no authorities or references are given for these statements. Further he adds, the Prior obtained permission to build a chapel on the bridge dedicated to St. Lawrence, to catch oblations from passers by. Here again his imagination has aided the elaboration. At the larger places or chapels proper oblations were made, but there is no reason to suppose that such was the case in so small a place or in such a situation as this Oratory. No permission would be necessary before building such a housing as there would be no episcopal consecration. Had any such thing occurred at the date given by Warner, it would have been, but is not, recorded in Bishop Drokensford's Register. So small and public a place could hardly have been enclosed, although a door to ensure some privacy may have existed. A door is shown in the drawing, but it must be remembered that by the then date the place, like that at Bradford, had long passed from its original use. These two examples of this class of bridge Oratory are the only ones known to have existed and as that at Bradford is now unique it should in case of any changes be most carefully preserved and allowed to remain. Having thus no other examples to compare, facts must necessarily be few. By a lucky chance there is just a record, a reference to what must have been something very similar, but of the building or place itself nothing is known. In the Return of the Church Goods of Derbyshire the Stanton next Swerston people had, "a chappell edified and buylded uppon Trent in ye mydest of the greate streme anexed to Swerston bregge, the whiche had certayne stuffe belonging to it; ij desks to knele in, a tabell of wode and certayne barres of yron and glasse in the wyndos." The word table here would probably be applied to a triptych or a painting or to something written in a table, and not to a table for use in our usual sense of the word. It can easily be imagined that such a furniture would suit exactly in our present case.

One reason perhaps why so little is known of this bridge is, that whilst the citizens of Bath had the duty of keeping it in repair, it was not quite within the city bounds. The suburb of South Gate Street was included for taxing purposes, but it was not until the extension of the bounds by the Charter of Elizabeth in 1590, that the Bridge was absorbed. This Charter starts the boundary, from the "south end" of the bridge where the "two images of a lion and a bear engraven in stone are erected," and then passing through the river westward presently turns eastward to Walcot church and then back through the river again to the "south end" of the bridge. In the drawings the lion and the bear are seen on two columns, officially there as being the supporters of the Bath arms. The idea of Warner that the Bridge was first built in 1340 cannot be accepted, as certainly there was a bridge before that date. Thus in the time of Edward i., A.D. 1273, as recorded in the Hundred Rolls, a jury, when reporting on the neglect of the city walls, found that "Robert Cherin had a tenement within the city and a meadow without, for which he kept the gate on the bridge in time of war." The gate here mentioned is the same as shown in the drawings. This gate is also mentioned in Cox's *Magna Britannia* of 1727, where it is said, —a street leads to South Gate and then along the suburbs to the "Bridge laid over the Avon in the middle of which is an old gateway." This however was not exact as the drawings show the gate not in the middle but on the next arch southward of it.

Having no documentary evidence to determine absolutely the date or time of building of this bridge, an examination of the drawings must be made to help as much as possible. Taking first the East view, that is the view from the east side or looking west, it will be seen that two of the piers are round, perhaps because the rush of the river was not fierce thereabouts, and on

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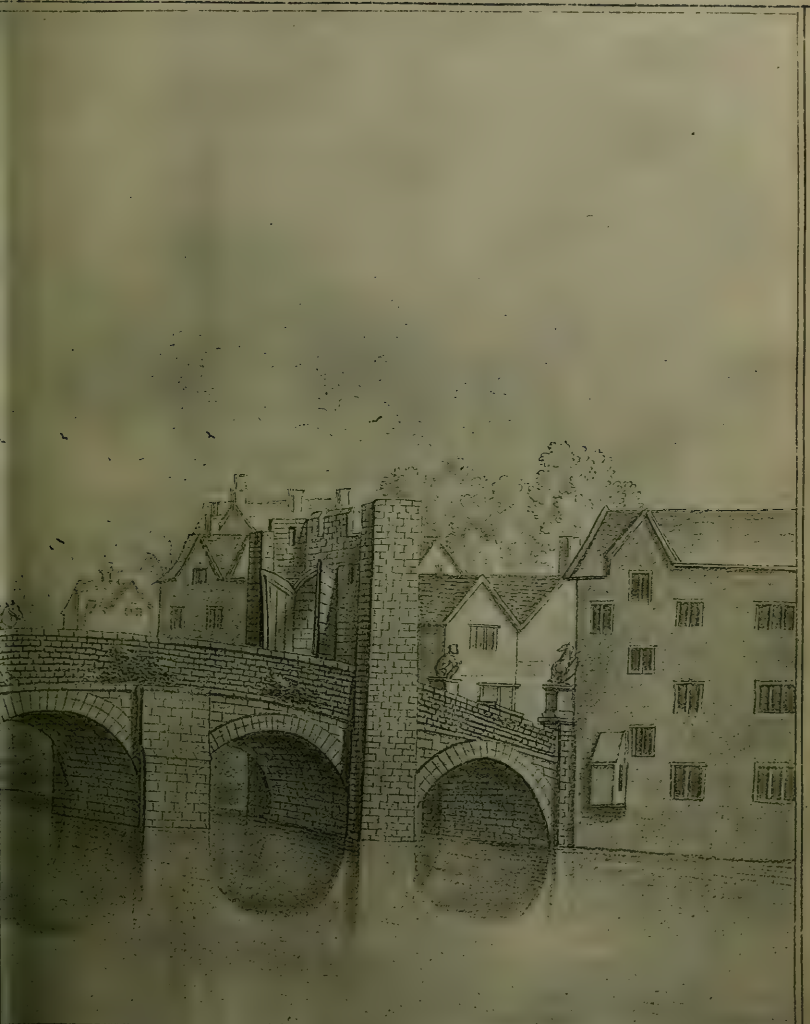
The West Prosp

BERNARD LENS. DEL: 1718.



t of Bath Bridge

A. BRIGGS, PHOTO-LITH.

one, or as part of one, of these stands the Oratory. The other two piers are angular forming cutwaters in the usual way, the outer or southern being carried up forms the side of the gateway, whilst the other towards the middle of the river has its base levelled as a standing or refuge for any one unfortunate enough to require it. There seems however to be something wrong, as it is apparent that the Oratory here is in the centre of the rise or arc of a bridge of four arches, the land on the north forming one end, the gateway on the south the other. The southern or fifth arch too is shown somewhat flatter than the others. Hereby one difficulty is removed as it may be judged that in the place of this fifth arch in the olden time was the drawbridge; without such a protection the gate would have been of but little use. On the shore can be seen one of the two stone carvings, either the lion or the bear; the other is hidden by a tree.

Taking next the West View, or view of the Western side, another difficulty occurs. Here the piers having no water resistance, are all flat, but it must be noticed that the rise of the bridge is much less and the centre is now on the middle arch, the extra or fifth arch outside the gate being as good and as round as the others. Perhaps the break in the other view caused by the Oratory may have deceived the eye. Both the lion and the bear are seen distinctly in situ. The large doors in the gateway are also well shown. On both sides, the parapet looks to be quite a distinct addition hardly incorporated with the substructure. The front of the Oratory shows some indented or sunken carvings of armorials, unfortunately not clear enough for definition, but beyond this no special architectural detail is visible. At the time the drawings were made, the minute study of architecture to which we are accustomed had not arisen, so that the draughtsman here, even if he could have done so, may not have cared to record so small a matter as an heraldic bearing. After this examination and generally, the judgment is that this bridge as seen, excepting the gateway, is a late fifteenth or even an early sixteenth century structure, rather after than before the year 1500. The gate of the early or 13th century bridge was allowed to remain. This is Norman in character and besides bearing every appearance of antiquity, is not a gate that would have been built late in the 15th or early in the 16th century. The writer in Cox of 1727 seems to recognise a difference, as he speaks of it as an "old gateway," thus implying that it was visibly older than the bridge. When the bridge seen in the drawings was built, the drawbridge being abolished its place was taken by another arch; the bridge then as an unguarded approach became rather a source of weakness. Thus it happened in the Civil War when in July 1645 Fairfax sent two companies of dragoons to Bath, no opposition was offered at the river Bridge or until the bridge at the South Gate was gained.

In the time of Monmouth's Rebellion the bridge was ordered to be destroyed, but the quick march of events prevented this as it became unnecessary.

A thirteenth century bridge would be flat or level on the roadway, the arches rather narrow or close together would be somewhat pointed and turned on a distinctive rather rough moulding. Perhaps the view of Bristol old bridge, the houses being removed, as given in Seyer's History of Bristol, Vol ii. p. 14, will help to give an idea of what the Bath early bridge was like. In the drawings we have fine and well turned round arches and a rise to the centre, all and each distinctive of a late date.

Although no earlier mention than 1273 can be given there must with fair certainty have been a bridge in times before that. Such bridge however would have been more or less of wood. Ingulph in his Chronicle under date A.D. 1085, relating the confirmation by William of the Laws of Eadward, makes an especial mention of the Fosse as one of four Royal roads. When remembering the known great Roman city Bath was, and that the Royal Fosse road passed not only through it but actually over the river near about where the bridge was and is, the idea or conclusion seems, unavoidable that a Roman bridge must have existed there. Such a bridge would be presumably of timber laid level on stone piers.

As already noticed the actual only authority for much that Warner has said must be John Wood, but Wood when writing on any but his own subject, architecture, must not be too easily credited. Wood then is the first who says without giving reference or authority, that this bridge and chapel were dedicated to St. Lawrence. Save that Barton Fair was held on St. Lawrence day the saint seems hardly localised. St. Katherine should have been the dedication when all surroundings are considered, she being everywhere present without and within the city. Her image stood in Stalls church, practically then the parish church of Lyncombe and Widcombe, and to it oblations and gifts were made. Then in the old oath of a Freeman, often quoted, when he swore "Seynt Katern day" he would "Kepe holy day" and "Seynt Katern chapell and the brygge help to mentayne and to susteyne," we have again a very close association. This however must be taken as simply a passing thought recorded only to draw attention to the point.

Whilst regretting that all efforts to find more evidences and more details have at present failed and that after so much criticism any point should be left unsettled, there yet remains the great consolation that some advance has been made, as without the beautiful drawings now for the first time brought to notice and so well reproduced, no useful criticism was possible.

Mr. J. T. Irvine has kindly sent the following notes, as extracted by himself from the Bath City Pay Rolls.

Roll No. 18. (? 27 Eliz.) Paid for poynting the chapel on the bridge—19d.

Roll 25, 1589. Paid for mending the chapel door on the bridge—6d.

Roll 54, 1614. Paid to the plumber for raising the wine pipe upon the Bridge and for sodder about it used—7s.

Paid to Nicholas Baker for a new door for the chappel on the Bridge and for lock and key for it—6s.

Roll 71, 1628. Paid Thos. Ward for rearing of artche at the Bridge gate and for 6 sacks of lime—£1. 4.—

In the Corporation Minutes for March, 1677 (p. 727) it was :—"Agreed by general consent that Henry Pitcher shall take his freedome for setting up the Beare and Lion upon the Bridge ;" and Roll 112 for the same year notes as,—Paid for setting up the Lion and Barr by order,—10s.

In the Corporation Minutes for 1717 the question was put "Whether John Pitcher free mason, on consideration of his putting up at his own charges ye images of a Lyon and Bear at ye foot of our Bridge shall as a reward for the same be made a freeman of this City." The answer was, "Agreed."

The Vineyards of Somerset and Gloucestershire. By the Rev. Canon Ellacombe, F.L.S.

(Read 15th January, 1890.)

In the following short paper I do not propose to go into the whole subject of English Vines and Vineyards—I have done that elsewhere*—but to narrow the subject within the purview of the Bath Field Club. But really that does not very much narrow the subject—for the culture of the Vine was almost entirely confined to the Southern Counties of England (not quite, for there was a great Vineyard at Ely, and even as far North as Durham)—and while there are less than forty entries of Vineyards in the "Domesday Survey," six of them are in these two Counties.

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* In "Plant Lore and Garden Craft of Shakespeare," 2nd edition, 1884.

I begin with Somerset. The earliest notice of a Vineyard in the County, and almost the earliest notice of one in England (except the general notice of Vines in England by Beda in the 8th Century), is in "the confirmation of a grant of a Vineyard by King Edwyth to Glastonbury Abbey in the 10th Century. This Vineyard was situated in Pattensberg in Mere, Co. Somerset." *(Gard. Chron. Nov. 17th,* 1888.*)*

In the "Domesday Survey" the following Vineyards are mentioned in Somerset:—Among the possessions of the Church of Glastonbury there are at Glastonbury "iij arpents of Vineyard. In the manor adjoining an island called Mere, where are sixty acres of land; and two arpents of Vineyards." . . . "Another island belongs thereto, which is called Padenebene; There are six acres of land and iij arpents of Vineyard." These two places—Meare and Pamborough—are close to Glastonbury, and are within the Hundred of Glaston twelve hides—and there can be little doubt they are the Vineyards that were given by King Edwyth. "In the Inquisition of the Manors of Glastonbury Abbey, by Abbot Henry de Soliaco in 1189, there are several tenants of the Manor of Glaston mentioned, who as part of their work had to cultivate the Vineyards—'fodit in Vinea'—and one tenant, who had the principal charge of them, was 'Elwinus Custos Vinee.'" The Vineyards are not referred to at the time of the dissolution of the Abbey, but about that time we find reference to lands called Wineyats, and the site of the Vineyards on the Southern Slope of Weary All Hill or Werrell Hill is still called Vineyards. *(MSS. inf: Vicar of Glastonbury.)*

There are still remains of the old Vineyard at Meare. There is a ruined wall which formerly served as the back wall to the vines, and some of the stone projections are there to which the vines were fastened. The field itself is still called the Vineyards *(MS.: Vicar of Meare.)*

At Dunster there is a small plot of ground, less than an acre in extent, on the south side of the hill called the Vineyards, in a very sunny and sheltered situation. The ground is in terraces, but whether they were made for the vines or for the later native industry of clothmaking is uncertain.

We have at Bath the street called the Vineyards—but I have not been able to find any record of the Vineyards that were once there beyond the name. In such a position I should have thought they must have been noticed by some of the many writers on Bath; but the writers on Bath—Warner, Wright, Earle, &c., are quite silent about them. Vineyards are beneath the dignity of historians. The only old record that I can find of them is in the "Municipal Records of Bath," lately published, where (p. 41) there is a note on the boundaries of Bath in a charter of Queen Elizabeth. Part of the boundary is "the highway leading from Weston towards Walcot, so continuing by the said way into a close of pasture called the Vineyards." This looks as if even then the Vineyards were discontinued and the land put into pasture.

But if the culture of the vine was discontinued there, it was not entirely given up near Bath. In Savage and Meyler's "Map of Five Miles Round Bath," published in 1805, there is a Vineyard marked at Claverton, with the vines distinctly shown. The site can be easily made out, and it is a garden attached to the Vineyards Farm. It is enclosed on three sides by an old wall, and it contains an old building which Mr. Skrine considers to have been the wine-press. The property was purchased in 1701 by Mr. Richard Holder, and part of the purchase money was £28 for "four hogsheads of wine of the Vineyards of Claverton."

Before leaving Somersetshire we may note the record of a Vineyard at Wilcot, in the adjoining County of Wiltshire, because it has a special note of commendation in "Domesday":—"Ibi Ecclesia nova, et domus optima et vinea bona." I am informed by the present Vicar of Wilcot that he has cultivated vines there for more than thirty years, and during all that time he has never succeeded in picking a single ripe grape.

I now come to the Gloucestershire Vineyards. The first mention of the Vine in Gloucestershire is in "Domesday," and in the "Gloucestershire Survey" "it is only once mentioned—'ii—arpenz Vinee' are registered at Stonehouse on land which had belonged to Tovi, a large landowner, before the Conquest, and which was held in 1086 by William de Ow. . . . . It is surprising that mention is made of only one Vineyard . . but it is interesting to note that it was situated near to the Roman settlements of Frocester and Woodchester, and there could be few warmer spots in the county than the south-western slope of the hill above Stonehouse. The arpent was certainly less than half an acre in extent, so that William de Ow's Vineyard covered less than an acre. About a mile and a half north of Stonehouse is a farm which bears the name of Vinegar Hill Farm; it is now, and probably always has been, in the Parish of Standish, but the name is interesting as a testimony to the cultivation of the vine in the immediate neighbourhood of the spot where the 'Domesday' Commissioners found it."*

The next notice of the Vine in Gloucestershire is in the well-known description of Gloucestershire by Wm. of Malmesbury, who was born at the end of the 11th Century, and published his book, "De Gestis *Pontificum Anglorum*," about the year 1125. In it he says, "The Vale of Gloucester yields plenty of corn and fruit. . . . . Here you may behold Highways and Publick Roads full of Fruit Trees, not planted but growing naturally. The earth bears fruit of its own accord, much exceeding others both in taste and beauty, many sorts of which continue fresh the year round, and serve the owner till he is supply'd by a new increase. No county in England has so many or so good Vineyards as this; either for fertility or for sweetness of the grape. The wine has in it no unpleasant tartness or eagerness,† and is little inferior to the French in sweetness." *(Camden, p. 267.)* This is Wm. of Malmesbury's testimony to the excellence of the Gloucestershire Vineyards as translated by Camden, and in connection with our present subject it is interesting to note that Wm. of Malmesbury, though he lived most of his life in Gloucestershire, was a native of Somersetshire. Camden's Commentary on the passage is this—"From hence we are not to wonder that so many places in this County from their Vines are called Vineyards, because they formerly afforded plenty of Wine, and that they yield none now, is rather to be imputed to the sloth of the inhabitants than to the indisposition of the Climate. For now these Vineyards have nothing left in this County but the places nam'd from them; viz., one near Tewkesbury, at present called by the Vineyard, and another on a rising hill by Overbridge, near Glocester, where was a large house, moted round, belonging to the Bishop of Glocester, built about the year 1351 by the Abbot of Glocester," p. 269. So far Camden—but we shall see presently that his idea of the complete destruction of Vineyards in Gloucestershire was not quite correct.

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* "Taylor's Domesday Survey of Gloucestershire," p. 70.

† Eagerness lit: trans: of acritudo—eager=acris, the word survives in Vinegar, *i.e.*, vin—eager—vinum acre.

Next to William of Malmesbury we come to Alexander Neckham. He was Abbot of Cirencester from 1213 to 1217, and was a learned man and a good scholar. He was also a close observer and wrote a book, "De Naturis Rerum," which may be considered the best book on Natural History at that date. Unfortunately for our purpose, his object was not so much to record facts in Natural History (though he does so largely), but to moralize upon them, and it is often very difficult to know whether the facts he quotes are the results of his own observation or gathered from books. His 167th chapter is de Vinea, and if we may suppose that he is speaking of the vine as seen by himself in England (perhaps in Gloucestershire) it is a strong testimony to the vigour of the English vine, for he tells us that the vine branches supported by stakes and intertwined together make good arbours (thalamos aspectu decoros vites prœbent), and further that they are good to grow against a house, because "pampinus latitudine tua excipit aeris insultus, cum res ita desiderat et fenestra clementiam caloris solaris admittit." That this was a common use of the Vine appears from Lydgate, who, writing in the 15th century, speaks in one of his minor poems of "Vinettes running in the casements," and so Professor Willis, in his "Architectural History of Cambridge," considers that the Vine was generally planted for the shade it afforded." *(Gard. Chron., Novembev 17th,* 1888.*)*[*]

From these general notices of the Vine, I come to a list of the Vineyards in Gloucestershire so far as I have been able to make them out, but I feel very sure that there must be many more.

You have heard mention of two by Camden, one at Tewkesbury —of which record still remains in a field called the Vineyard or Winyatts—the other at Gloucester. This was on the estate of the Abbot of Gloucester, and we are told that when Queen Elizabeth was making her progress through Gloucestershire in 1592 she "was met at Prinknash by the Abbot of Gloucester, who conducted her through Gloucester to his mansion on Vineyard Hill. *(Trans. Gloucester and Bristol Archæological Society, vii.,* 274.) I believe the name still remains.

At Winchcombe there is a street called Vineyard Street, which must mark the site of an ancient Vineyard, probably belonging to the Abbey of Winchcombe, but Mrs. Dent, the able historian of Winchcombe and Sudeley, has not been able to find any further account of it.

At Upton S. Leonards the site of an ancient Vineyard is also marked by the present name.

In 18. Ed. II., William Mansfield was siezed of a Vineyard, vi acres of land, and iij acres of wood in Bisley. *(Atkins, p.* 32.*)* Of this there are no remains.[†]

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[*] Polydore Virgil gives the same use of the Vine in England:— "Vites in hortis magis umbræ quam fructus causâ passim crescunt." —Angl. Hist., lib. 1.

[†] Bisley proper is one of the most bleak places in the county, but there are warm sheltered valleys in the parish well suited to Vine growing.

"On the way from Olveston to Thornbury, on the left hand side of the road, there is the site of an old Vineyard, the terraces in which the Vines were planted being still visible. It is well situated, both as to soil and aspect, for the growth of Vines, but it is supposed that Vines have not been grown there for the last 300 or 400 years." *(Bristol and Gloucester Archæological Society, vol. xii., p.* 329.) I do not know on what authority the last statement is made, but it will form a good introduction to an excellent instance of a much later growth of the Vine in a Vineyard in Gloucestershire. The most remarkable remains of a Vineyard in Gloucestershire, and probably in England, is at Tortworth. My attention was first drawn to it by a passage in "Rudge's Gloucestershire," 1803, that "about the beginning of last century there was in the Park of Cromhall a large Plantation of Vines, which is said to have produced ten hogsheads of good wine in one year," with the note added that "the Vine plantation was discontinued, or destroyed, in consequence of a dispute with the Rector on a claim of the tythes."

Upon this I wrote to Lord Ducie, and from him received full information, and examined the Vineyard, and last month I had the advantage of again closely examining it and taking accurate measurements of it with him and Lord Moreton. The Vineyard is in a wood about a quarter of a mile from the present house, and it is in Cromhall Parish. The position is peculiar, and has been admirably chosen for the purpose. It is on a steep but not high hill, which may be said to form the Northern base of an irregular triangle. This Northern base is a shallow segment of a circle, the centre being almost due South, so that from sunrise to sunset there would be more or less of sun shining on it. (About fifty years ago there was a fashion of building the walls of kitchen gardens in shallow segments of circles for the purpose of getting all possible sunshine. I know of such in the Rectory Gardens of Dodington and Iron Acton.) The two other sides of the triangle are steep hills sufficiently near to protect the Vineyard from winds, but not so near as to prevent the sunshine—so that the result is that the Vineyard got the maximum of possible sun with the minimum of wind. The hill is a mountain limestone, and the soil seems to be shallow and stony. The terraces begin from the lowest level within a stone's throw of a small brook that runs through the Valley. There are seven distinct terraces—divided from each other by walls a yard high, the distance from wall to wall being from 12 to 14 feet—the terraces vary in length according to the slope of the hill, the longest being 320 yards. The walls are built of the mountain limestone of the hill. The spaces between the walls have not been levelled, but follow the natural slope of the hill. The site of the Vineyard is now chiefly covered with yew trees, and it was the opinion of Sir Joseph Hooker, who examined it a few years ago, that these yew trees were of comparatively recent growth, none of them probably more than 60 or 70 years old. With the exception of one tree growing near the brook I should quite agree with this, and the fair presumption is that that to a great extent gives the date of the destruction of the Vineyard. But on this point Lord Ducie has kindly sent me the following particulars. Writing in September, 1887, he says, "My late agent, now living, a very old man, has often told me that 50 years ago he remembered seeing a few wild Vines among the bushes in the Vineyard—and in January, 1882, calling upon William May, an old Cromhall Labourer, who had spoken to me of his recollections of the Vineyard—in answer to my questions, and on my reminding him of his having told me how he had stolen grapes in the Vineyard as a child—they were even then, out of cultivation and growing wild—he said:—

"I do mind the Vines; they growed between the path and the brook—black ones. It were nigh about vower score year ago. I be now in the 88. My father telled me as how one year there were dree 'ogsheads of wine made there.' W. May's memory was as sound as ever, and his faculties clear."

I have dwelt at some length on the Tortworth Vineyard, because I suppose it to be the best existing specimen of an old English Vineyard, and so is most interesting as the last record of an agricultural industry that once gave occupation to a large body of labourers in the Southern Counties, but which has now completely passed away, and can never return, at least, in its old form. In another form grape growing in England has had a great revival, chiefly in Sussex, where grapes are again grown by the acre, but they are under glass, and not on the open hillsides of the Cotteswold.

A few other memories of the Vine in Gloucestershire remain in Viney and Viney Hill in the Forest of Dean, in Viney Farm near Mangotsfield, and perhaps in Winneycroft in Matson, and in the surnames of Viner and Wineyart (now Winyatt), once more common in Gloucestershire than they are now.

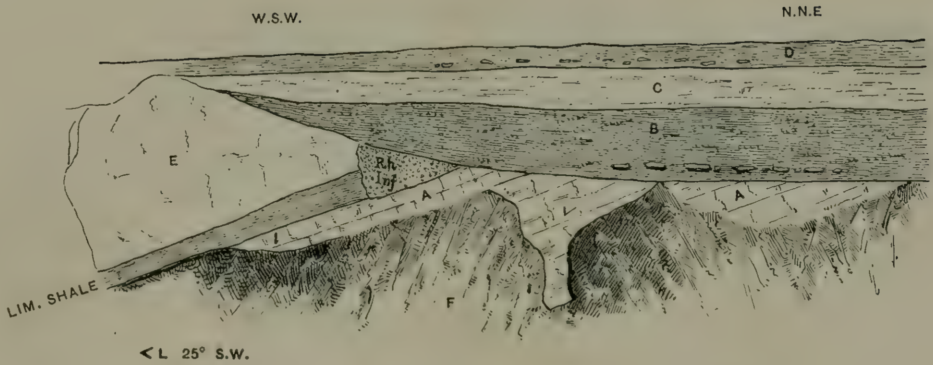
There are one or two points in connection with our Vineyards which should be noted. One is the "lychetts" as the terraces are called which are so common on our hillsides, and which by many are supposed to be sites of ancient Vineyards. By others they are supposed to be natural formations, while Professor Seebomm sees in them the remains of common lands farmed by Village Communities. For this last suggestion I think the proofs are quite insufficient, and I feel sure they are not natural formations. They are found on all sorts of soils—they are abundant on the oolites of the Cotteswold, and on the chalk hills of Wiltshire, and last summer I saw them in several places on the limestones of the Jura. There can be really little or no doubt that they are the work of man. They are the necessary result of any attempt to bring a steep hillside under the spade or plough, and they have their prototypes in the tracks made by sheep and cattle on steep hillsides. On the Cotteswolds nearly all are now covered with grass, but in Wiltshire you may see them still in process of formation, especially on the hills near Calne, and you may there see how the terraces have a tendency to get wider on their flat surfaces every year, while the sloping steps become each year more and more vertical, as the ploughman ploughs each year a few inches more into the inner edge, and throws over each year a few inches of soil on the outer edge. Any of you who would like to examine them may find plenty within an easy walk of Bath—there are signs of them even on the North Common—there are plenty on the hill sides near Swanswick and Cold Ashton, and, indeed all up the Cotteswold, and you will see that they are all planned with the design of getting a good sunny aspect and a shelter from the North and East. One of the best I know is at Upton in my own Parish. The field is only about three acres, but in that small space provision has been made for a perfect garden, or whatever else it may have been. The field has a steep slope to the South and West. At the bottom are three wide but rather shallow terraces running East and West, the rest of the slope being taken up with very broad terraces and very deep steps, running North and South, at right angles to and dying into the lower ones. By these means the place was a perfect suntrap, with complete shelter from the North and East. If Vines would do well anywhere it would be there, but we have no evidence that there ever was a Vineyard there, and there is no proof, as far as I know, that any of the "lychetts" were so used. They may have been so occasionally, and very probably were, but I should think it quite certain that they were not made exclusively for Vines, but for anything for which sun and shelter would be good. The chief interest in them lies in the evidence they give that in times gone by a much larger extent of our hill country was under the spade or plough than there is now.

Another point of interest in the old Vineyards is the question of the quality of the Wine. You have heard that William of Malmesbury thought the Gloucestershire Wine as good as French Wine, and in 1820 Phillips gave his judgment that some English Wine "was quite equal to the Grave Wines, and in some instances, when kept for eight to ten years, it has been drunk as Hock by the nicest judges." According to Hughes, a writer on English Vines and Vineyards in 1670 "Our English Wines are known to us and distinguished most properly by the names of deeper and paler coloured Clarets. White Wines are of two sorts, either sweeter or more sharp or austere—also a small Frantinick Wine—these are the Wines which this Climate most affords"—*(Hughes, p.* 63*).* The general evidence on the English Wines shows that they were of a poor quality. I should suppose they were no better than the Wines still occasionally made in old-fashioned farmhouses. Many of you must at times have been compelled to drink such Wine, as I have been, and have had to put a great strain on our consciences to pronounce it good, and often a great strain on our palates to drink it.

I have put together these few notes on the Vineyards of our neighbourhood in the hopes that the members of the Field Club will add to the many other points, which they observe in their walks, the evidences of ancient Vineyards—such evidences being looked for either in the names of fields, or in the actual remains of Vineyards still existing—or in notices of them in old records—I shall consider it a kindness if any member making any such discovery will kindly inform me of it.

In conclusion, I ought shortly to notice that some writers have asserted that the so-called Vineyards were only Orchards. Though some of these writers were good Antiquaries, I must say that I see no proof whatever for such a statement. Our ancestors knew the difference between grapes and apples, and were not likely to confuse a Vinea with a Pomarium.

LUCKINGTON QUARRY.



		FT.	IN.
A	Carboniferous Lim. (exposed)	3	0
B	Black Rhætic Shales, with Bone Bed at Base	4	4
C	White Lias, Shales and Clay	2	3
D	Humus, with White Lias *debris* at Base ..	1	0
E	Mass of Pinkish Limestone, with Rhætic Conglomerate at N.E. End		
F	Debris		
<	Dip of Lim. 25° W.S.W, ...		

TOTAL DEPTH OF SECTION .. 14 7

On a Rhætic Section at Luckington, and Additional Notes on the Vobster Quarry. *By* Rev. H. H. Winwood, M.A., F.G.S.

(Read 12th February, 1890.*)*

During the past autumn it has been my custom to make a weekly expedition, with a geological friend, Professor Lloyd Morgan, to examine some of the interesting problems, still awaiting solution, afforded by our beautiful neighbourhood. On one of the fine days, which at that time of the year especially make out-door life so enjoyable, our object was to re-visit the Vobster district, and to see whether recent quarrying or other works had in any way thrown additional light on those complicated disturbances which have employed the pen and taxed the imagination of so many geologists to explain. We were fortunate in being accompanied on this particular day by Mr. McMurtrie, whose researches in the Radstock Coal Field are so well known, and the results of which have been so admirably given in various papers contributed by him to our "Proceedings."

After detraining at Mells Station, we followed the tramway to Upper Vobster quarry, and found that Mr. Batey, the proprietor of those fine workable beds of Limestone, had done much of late to clear up several points, hitherto obscure (but of this more anon). Leaving this quarry for the time, we passed the Newbury and Mackintosh pits, and whilst looking about for any exposures of Limestone, or other rocks in the adjoining fields, dropped into "Black Lane" (situated on the line of fault running N. and S., and joining the great overlap fault nearer Radstock), and followed it up to the well-known section of Limestone lying to the East of Luckington Farm. These two quarries—Upper Vobster and Luckington—have been rendered classical by past descriptions. When seen at a little distance off, the section there exposed appears to be Carboniferous Limestone, with black shales resting on its exposed surface. These latter, from a cursory view, might be, and have hitherto been, taken for either the Upper or Lower shales that occur in association with these strata, or with the true shales of the Coal Measures, which one might expect to see anywhere in this much disturbed country. A closer inspection, however, proved that they were neither the one nor the other, but black shales belonging to a formation much higher up in the Geological series. Whilst looking over the *débris* or *talus* covering the foot of the quarry a portion of a whorl of a thick ribbed, keeled Ammonite was picked up. Well! Amateur Geologists though we were, we knew sufficient of the A B C of the science to conclude that Ammonites did not live in the Coal Measure days, at least so far as discoveries have hitherto revealed the fauna of that period. This led to further search, and whilst examining some of the shaly clay *in situ* it fell to my lot to find traces of a shell well-known to myself and others as at once characteristic. For between the thin laminæ impressions of the well-known *avicula contorta* occurred in sufficient quantity to indicate that these were the so-called "paper shales" of the Rhætic Measures.

The following is the description of the quarry :—

According to Mr. McMurtrie, this mass of Limestone in which the quarry was worked, 800yds. W. of that at Vobster, and 1,900yds. N. of the Mendip hills, is 450yds. in extreme length, and from 50 to 120yds. wide.

The base shows an exposure of Carboniferous Limestone running N.E. and S.W. for some 60ft. Formerly worked for the lime kiln or for road metal, the face has receded some little distance from the lane entrance, and probably further workings have been found useless owing to the thickness of the "heading" of black, unprofitable, clayey shale that, falling from above, now forms a thick *talus*, covering up the more solid beds below. The Limestone apparently dips to the S.W. Its *basset* edges, where it crops up to the surface, have been planed off almost as level as a billiard table, reminding one of that celebrated section in the

Vallis, where the Inferior Oolite rests on the levelled surface of the older rocks in the same way. Another example of the vast amount of denudation which the inrush or outrush of some mighty waters have brought about in past times!

Succeeding these planed off inequalities of the Carboniferous Limestone are the Black Rhætic Shales. Can we realise the vast space of time represented by this gap? If we are dealing with the Upper Limestones of this series, there ought to come in the thousands of feet of the Coal Measures proper, and the greater portion of the New Red Sandstone series, measured by at the least many hundreds of feet, before we come to these Black Shales, whose normal position is on the top of the New Red Sandstone or the Keuper Marls.

The Black Shales, in places mottled and rusty in colour, are about 4ft. 4in. thick, having at their base, where they rest on the Limestone, small rounded pebbles. About 5in. from their base, non-continuous patches of the Bone bed—of varying thickness, and only found in the centre of the section where the shales are thickest—come in, of the usual thickness of 1½in.

Next comes White Shaly Clay, representing the White Lias, 2ft. 3in., capped by humus containing broken-up pieces of White Lias at its base. At the left hand side, or S.W. end of the section, a mass of pinkish mottled Limestone, 10ft. long by 9ft. high, appears rather puzzling to account for; at first, I was disposed to look upon it as one of those so-called *dykes* or infillings described by Chas. Moore, so familiar to us in the Vallis; its somewhat brecciated appearance on its exposed face lent weight to this opinion. Adhering to this mass, at the N.E. corner, and graduating into the pinkish brecciated rock of which the rest is composed, was a patch of conglomerate containing pebbles, fish teeth and bones of Rhætic age. Beneath this solid mass comes in Black Shale and Clay, with carbonaceous markings, 6in. Beneath this a band of solid Limestone, dipping 27° S.W.; a foot or so only of this is exposed, the base being covered up with *debris*. Sufficient, however, is seen to indicate the direction of the dip. A fault appears to have squeezed in an angular bit of pebbly conglomerate of Rhætic age, consisting of Limestone, black chert, angular stones and water-worn rounded pebbles, on which the black clays rested, and reminding me forcibly of the same deposit seen near Hapsford Mills, in the Vallis. Only a few inches, some 4 or 5, of Black Rhætic Shales cap the mass of Limestone at the S.W. end, but these gradually thicken out to the N.E. of the section. The total depth of the beds exposed is about 14ft. 7in., but what the thickness of the Limestone may be beneath its superincumbent deposit is not easy to judge, and, from the absence of fossil evidence, a definite conclusion as to its position in that series cannot be arrived at—whether, that is, we have here an exposure of Upper, Middle or Lower beds—probably the first of the three. On a subsequent visit through the kindness of Mr. Batey the Limestone had been proved to continue right to the bottom of the section, and it was stated by him that at about 15yds. S. from the present face the solid beds had been worked out, and were found resting upon Black Shales. Does this fact indicate that these beds belong to the Upper or Lower portion of the series—in both of which shaly beds occur? Further opening up, or rather deepening down, of this section can alone determine. This further extension and over-lapping of those remarkable beds (the Rhætics), whose existence in these parts, if not in England, was first made known to the Geological world by the late Charles Moore, a former member of this Club, seemed to me worthy of record, and to be one of the objects for which we have been especially constituted.

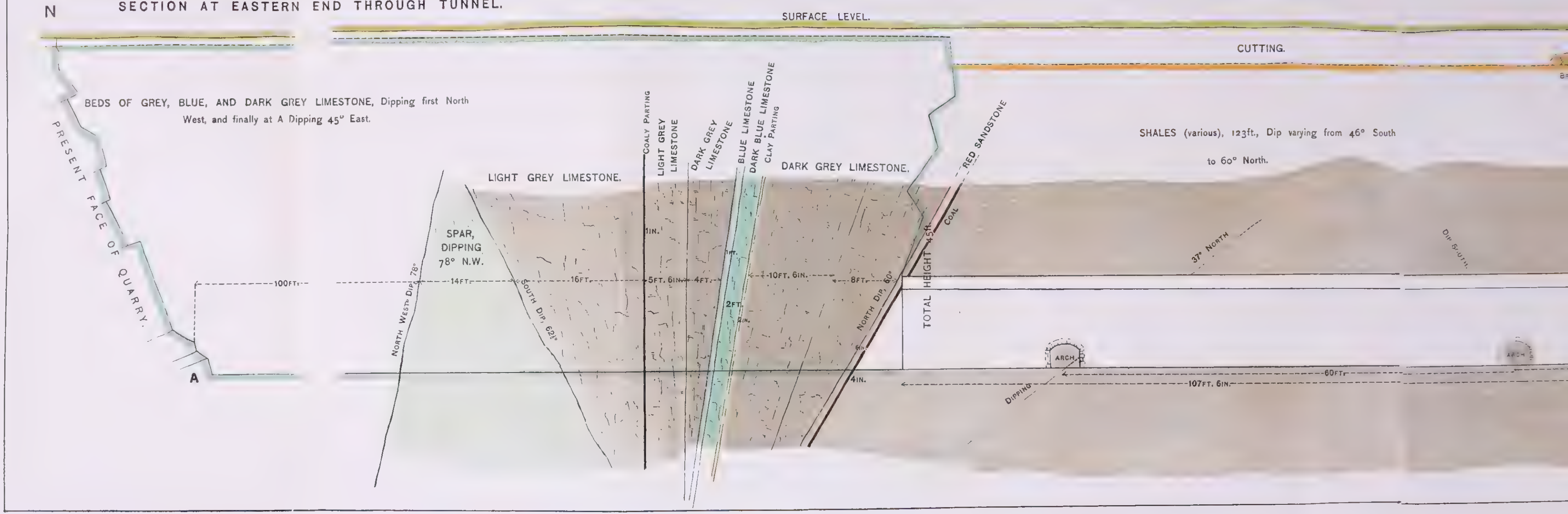
ADDITIONAL NOTES ON THE VOBSTER QUARRY.

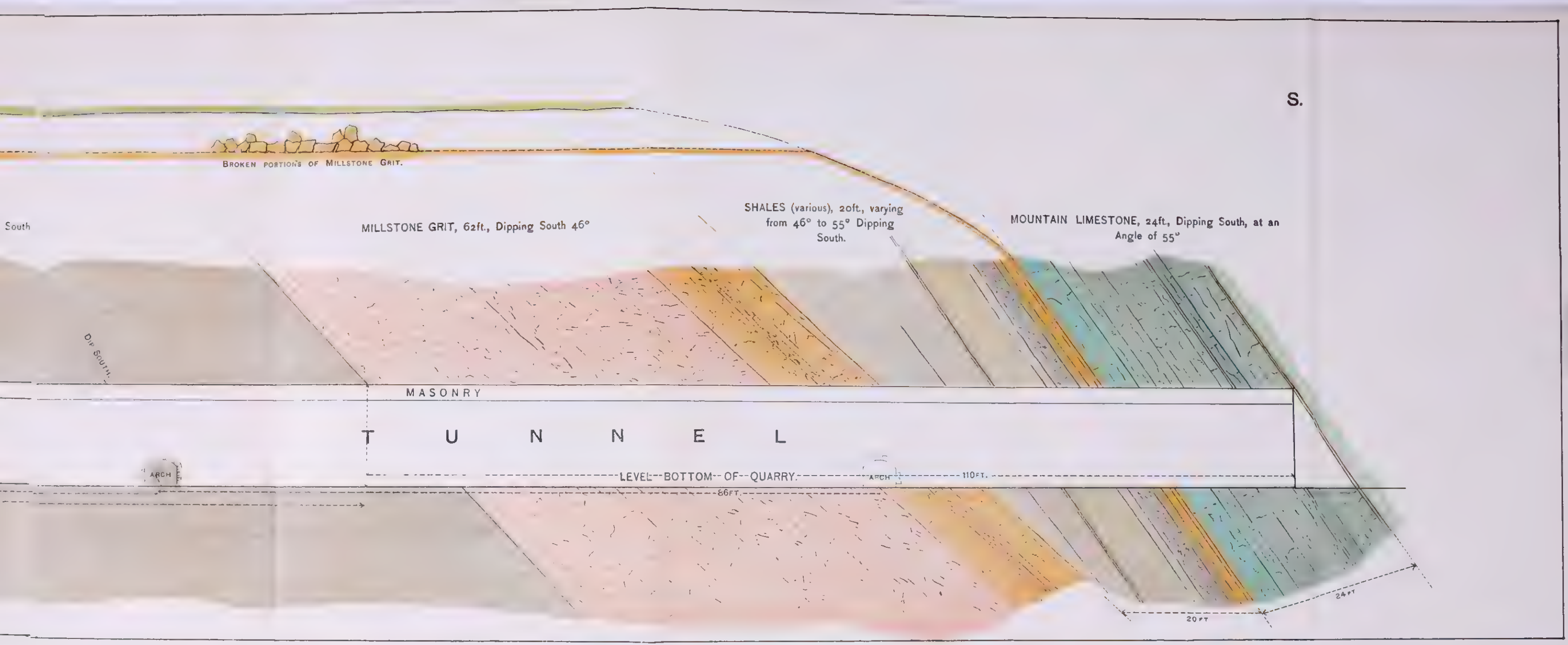
It now remains for me to say a few words explanatory of the section which, by the kindness of Mr. Batey, I am enabled to bring before you this afternoon. In the section printed in the "Proceedings" for 1882, Vol. v., p. 24, the Tunnel had only been

VOBSTER QUARRY.

SCALE—10 FEET TO AN INCH.

SECTION AT EASTERN END THROUGH TUNNEL.




S.
Broken portions of Millstone Grit.
South
MILLSTONE GRIT, 62ft., Dipping South 46°
SHALES (various), 20ft., varying from 46° to 55° Dipping South.
MOUNTAIN LIMESTONE, 24ft., Dipping South, at an Angle of 55°
Dip South
MASONRY
TUNNEL
ARCH
LEVEL BOTTOM OF QUARRY
ARCH
110FT.
86FT.
20FT
24FT

driven some 60ft. through the Mountain Limestone Shales and Millstone Grit. Since then it has been extended to a length of 218ft., opening out at the E. end into a large quarry, now being actively worked. An addition of 38ft. 6in. of Grit must now be made to the 24ft. already shown, making a total of 62ft. 6in. altogether. The dip of these beds is 46° S. They are followed by Shales dipping from 46° S. to 60° N. and some 124ft. thick. Immediately outside the masonry of the Tunnel on the E. a thin seam of coal, 4in. thick, comes in, succeeded by a band of red rock, 6in. thick, with a N. dip of 60°, corresponding with that of the coal. Then follow a series of dark grey Limestones, so much disturbed that the dip is difficult to make out, succeeded by a dyke or infilling of a peculiar pinkish streaked crystalline Limestone, standing up like a wedge in the middle of the quarry—the more profitable Limestone having been worked out on either side. The solid beds of Limestone have been excavated for a distance of 100ft., and then comes the furthest end of the workings, where the beds dip finally 45° E. The section is worthy of finding a permanent place in our "Proceedings," but whether it any way tends to unravel the complications connected with the Vobster disturbances, perhaps some member of the Club may be better able to decide than I can myself.

On a Comparison of the Somerset Coal Field with the Coal Measures of Belgium and the North of France. By J. McMurtrie, F.G.S.

(*Read* 12*th February*, 1890.)

Most Geologists who have turned attention to the subject, have been impressed with the close resemblance which exists between the Coal Measures of Somersetshire and those of

Belgium and the North of France. In a paper on the South Western District of England, contributed to the Geological Society by Dr. Buckland and Mr. Conybeare, as long ago as the year 1826, they noticed its resemblance, both in geological structure and picturesque features, to the country between Namur and Liege; and, in an important paper by Mr. Godwin Austin in the "Proceedings of the Geological Society" for 1855, he expressed a decided opinion that the Coal Measures of a large portion of England, France, and Belgium were once continuous, the present coal fields being merely the fragments of one original deposit. Sir Roderick Murchison held a contrary view, and read a paper on the subject before the British Association, at Nottingham, in 1866, but the opinion advocated by Mr. Godwin Austin and others seems destined to prevail.

During the inquiry of the Royal Coal Commission, in the year 1871, the question was considered of so much importance that Committee D, which was presided over by Sir Roderick Murchison, devoted much attention to the subject, and Professors Ramsay, Etheridge and Hull were called to give evidence, the result of which was embodied in an able report by Professor Prestwich, which will well repay a careful perusal; and, although speculative Borings, since put down in various parts of the South of England, have failed to prove the existence of Coal Measures eastward of Frome, many are still confident of ultimate success.

Being much interested in the question, the writer, in the summer of 1886, accompanied the South Wales Institute of Engineers through some of the most interesting parts of Belgium, when he was much impressed with the similarity of conditions to those with which he was familiar nearer home; and more recently he has obtained much additional information on the subject from Dr. Hovelacque, of Paris, who attended the British Association meeting at Bath in 1888, and spent much of his time in visiting the Radstock Coalfield. Dr. Hovelacque's special object was to compare the specimens obtainable at Radstock with the flora met with on the Continent, but the writer had frequent opportunities of discussing with him the general features of the district, and he has since been indebted to him for an extensive series of notes on the Coalfields of Belgium and the North of France, dealing especially with the physical geology of those countries in a manner so comprehensive as to furnish material for a much more exhaustive paper on the subject than is possible on the present occasion.* Time will only admit of calling attention to a few of the more important features in typical localities, but the writer would desire to express his great obligation to Dr. Hovelacque for the valuable information received on the subject.

OVERLYING ROCKS.

In comparing the geological features of the two coalfields, it will be convenient to group these notes under various heads, beginning with the overlying rocks, which naturally come first in order.

It is hardly necessary to explain that throughout the greater part of the Somerset Coalfield, the carboniferous strata do not come to the surface, being overlaid for the most part by secondary rocks of varying thickness. Between the Mendip Hills and the centre of the Radstock basin these overlying strata consist of the Lias, Rhætic and New Red Sandstone, the latter occupying the bottom and lower slopes of the valleys, while, on the higher ground, the New Red is overlaid by the Rhætic and Lias, which occupy the summit of most of the table lands in and around Radstock.

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* In a subsequent letter from Dr. Hovelacque, he wished to explain that the notes referred to were not entirely his own, but were rather a recapitulation of the principal works on the subject, including the following papers by Professor Gosselet, to which he was largely indebted, viz., "Etude des terrains primaires du Nord de la France et du Boulonnais;" "Esquisse géologique du Nord, 1880;" and "L'Ardenne, 1889."

In proceeding eastwards these rocks are in their turn overlaid by other newer formations, which taken in ascending order consist of Inferior Oolite, Fuller's Earth and rock, and the Great, or Bath Oolite, of Combe Down, which is the highest rock within the probable limits of the Somersetshire Coalfield. Many of the pits have been sunk through the Lias, Rhætic and New Red Sandstone before reaching the Coal Measures, and in some instances, as at Braysdown, the shaft begins as high up as the Inferior Oolite, which is the highest formation that any pit in the district has yet passed through, the section of strata, as proved in that pit, being as follows:—

	Feet.
Inferior Oolite	25
Lias and Rhætic	116
New Red Sandstone and Conglomerate	176
Total depth to Coal Measures	317

Leaving the probable limits of the Somerset Coalfield under the Great Oolite of Combe Down, and tracing our way, with the aid of a geological map, across the south-eastern counties of England, we find the following strata appearing at the surface in ascending order, viz., the Forest Marble with Bradford Clay, the Cornbrash, Oxford Clay, Coral Rag, Kimmeridge Clay, Purbeck and Portland beds, Weald Clay and Hastings Sands, Lower Greensand, Gault, Upper Greensand and Chalk, above which lie the Tertiary formations.

Although a survey of the South of England has enabled Geologists thus to trace the out crops of the various formations which appear on the surface in regular succession, it must not be supposed that they are absolutely cumulative, otherwise any sinkings or borings towards the South East coast would present insuperable difficulties, the estimated thickness of overlying strata being 7,150 feet.

On the contrary, recent borings have shown that as one formation after another is overlaid to the Eastward, some become very much thinner and others entirely disappear, as will be seen from the following examples :—

Section of Well Shaft and Boring at Kentish Town.

		Feet.
Tertiary Strata	London Clay	236
	Sands and Mottled Clay	88½
Secondary Strata	Chalk and Chalk Marl	645
	Upper Greensand	14
	Gault	130
Palæozoic Strata, Red and Grey Sandstones		188
Total		1,301½

Section of Well Boring at Harwich.

		Feet.
Tertiary Strata	Earth and Gravel	25
	London Clay	23
	Sands, Shingle and Mottled Clay	28½
Secondary Strata	Chalk	888
	Upper Greensand	22
	Gault	39
Palæozoic Strata, Dark Slaty Rock		44½
Total		1,070

Or to take the more recent *boring at Meux's Brewery,* Tottenham Court Road, London, the Strata passed through were as follows :—

		Feet.
Tertiary Strata	Flint Gravel London Clay Woolwich and Reading Beds Thanet Sands	156½
Secondary Strata	Chalk and Chalk Marl	655½
	Upper Greensand	28
	Gault	160
	Lower Greensand	64
Upper Devonian		80
Total		1,144

In comparing the overlying formations met with in Somersetshire with those which prevail in the coalfields of the North of France and Belgium, a remarkable contrast presents itself, there being there almost an entire absence of everything between the Coal Measures and the Greensand, which itself is absent in places, the Chalk resting directly and unconformably upon the upturned edges of the Coal Measures.

The thickness of strata which has thus disappeared, as estimated by Professor Prestwich from the points of outcrops nearest London, is as follows :—

	Feet.
Weald Clay and Hastings Sand	2,000
Purbeck and Portland Beds	70
Kimmeridge Clay	450
Coral Rag and Oxford Clay	700
Oolites	500
Lias	600
New Red Sandstone	800
Total	5,120

An examination of the overlying formations shows that throughout the entire range of the French and Belgian Coalfield, the Coal Measures are either overlaid by the Chalk alone, or by the Chalk and Greensand, but in certain areas these are hidden by a covering of Tertiary Strata, the complete section in the latter case being as follows :—

Shaft Sections and Borings near Mons.

Quaregnon Shaft.

	ft.	in.
Brick Earth and Gravel	16	6
Tertiary Sands	41	8
White Chalk	383	9
Chalk Marl	48	5
Tourtia	4	0
Coal Measures at	494	4

Ville Pommerœul (Boring).

	ft.	in.
Brick Earth and Gravel	6	9
Tertiary Sands	47	0
White Chalk	300	0
Chalk Marl	544	6
Tourtia	3	2
Greensands	135	0
Coal Measures at	1,036	5

Boring at Calais.

	ft.	in.
Sands and Gravel	80	0
Tertiary Strata	161	0
Chalk and Chalk Marl	762	0
Upper Greensand ?	3	0
Gault ?	26	0
Carboniferous Strata	106	0
	1,138	0

Although so many formations are absent within and immediately around the coal basins of France and Belgium, many of them are found to exist in the adjoining country at no great distance. In a paper contributed by the Rev. J. T. Blake to the Geological Society in 1881 on the Jurassic of the Paris basin, he shows that most of the subdivisions of the Oolite from the Portland beds to the Oxford Clay are there represented, and the lower divisions of the Secondary rocks are met with in various parts of the Continent.

In comparing the conditions within the coalfield of France and Belgium with what prevail outside that area, we are reminded of a similar comparison drawn by Mr. Charles Moore in this neighbourhood in his able paper on "Abnormal Secondary Deposits," in which he shewed that many of those formations were either absent or only thinly represented in the Somersetshire coal basin. The inference to be drawn in both instances is the same, viz., that the carboniferous formation probably existed as an elevated ridge "which for many ages proved a barrier to the incursion of the deeper sea deposits which were taking place to the south, and in which were being accumulated the materials composing many of the Secondary rocks."

COAL MEASURES.

In comparing the Coal Measures of this neighbourhood with those of France and Belgium, there is great difficulty in obtaining such particulars of the latter as are necessary to draw a proper comparison.

The Coal Measures, as they exist in Somersetshire, consist of the following well marked divisions :—

		Seams.	Thickness of Strata. Ft.
Upper Division	Radstock Series	6	2,200
	Red Shales		
	Farrington Series	6	
Pennant rock, barren			3,000
Lower Division	New Rock Series	18	2,800
	Vobster Series	8	
	Barren ground		
		38	8,000
Millstone Grit			500
Carboniferous Limestone and Shales			3,600
Total			12,100

and it would be interesting to know whether similar subdivisions exist on the Continent.

In his report to the Royal Coal Commission, to which reference has already been made, Professor Prestwich has pointed out that in comparing the coal measures of South Wales with those of Somerset he found the same triple arrangement to prevail, due to the presence in both of the great mass of sandstone known as the Pennant Rock, and he found the total thickness of Coal Measures in the two districts to be nearly equal, but in minor points he considered it impossible to establish any co-relation. And it is not surprising that he found it even more impracticable to establish any co-relation between Somerset and Belgium, except in the following general particulars :—

	South Wales	Somerset	Hainaut	Liege	Westphalia
	Feet	Feet	Feet	Feet	Feet
Thickness of Strata ...	11,000 ...	8,400 ...	9,400 ...	7,600 ...	7,218
Number of Seams ...	75 ...	55 ...	110 ...	85 ...	117
Thickness of Coal ...	120 ...	98 ...	230 ...	212 ...	294

Professor Prestwich naturally remarks on the greater number of seams and greater thickness of coal in these Continental Coal-fields as compared with the English Measures, which he attributes to the fact that the Pennant Rock, which here is of great thickness, and contains but little coal, is replaced by productive Measures in Belgium.

Although, in the absence of the Pennant, the threefold arrangement of strata does not hold good on the Continent, it would appear from the information supplied by Dr. Hovelacque that the coal beds of the North of France have been divided into groups, distinguished partly by their mineralogical character, and partly by the fossil plants which they contain.

The mineralogical distinction between these groups consists in the fact that one is non-bituminous, another semi-bituminous, a third bituminous, and a fourth highly bituminous; but, judging from experience in South Wales, no reliance can be placed on any method of grouping which depends on the mere chemical character of the coal, as the same seams and groups of seams often present a very different character on opposite sides of the same basin.

The system of grouping based on the fossils associated with the different seams necessarily rests on a surer foundation, and M. Zeiller, an eminent Geologist, has thus divided the Coal Measures of the North of France into three zones, called, the Upper Coal Measures (Houiller Supérieur and Supérieur inférieur), the Middle Coal Measures (Houiller Moyen), and the Inferior Coal Measures (Houiller inférieur).

His views on the subject seem to be exactly in accordance with those of Mr. Robert Kidston, one of the best authorities on coal plants, who, in a paper "On the Fossil Flora of the Radstock Series of the Somerset and Bristol Coal Field," read before the Royal Society of Edinburgh, on the 4th of April, 1887, has stated as follows:—"The Radstock series belong to the uppermost beds of the British Coal Measures. Beds of the same age "as the Radstock series appear to be absent from France. Their "position is evidently between the Upper and Middle Coal "Measures of the French coal fields." Mr. Kidston has also given the probable equivalents of the French and British carboniferous rocks, as follows:—

France.		*Britain.*
Upper Coal Measures (Houiller Supérieur and Supérieur inférieur)		Absent
Absent		Radstock Series (Upper Coal Measures of Britain)
Middle Coal Measures (Houiller Moyen		Middle Coal Measures Lower Coal Measures
Inferior Coal Measures (Houiller inférieur)	Lower Carboniferous	Carboniferous Limestone Series Calciferous Sandstone Series

In an able letter to Mr. Kidston, M. Zeiller has given in detail the facts on which the foregoing classification is based, which he concludes as follows:—"From this the Radstock series represents, "in my opinion, a horizon that we have not in France, but "corresponds to the interval between the end of the coal deposits "in the North of France and the beginning of the coalfields of "the centre." And in a later letter M. Zeiller further says:— "The mixture they (the Radstock Series) present of Upper Coal "Measure species with Lower Coal Measure species is unquestion-

" able, but I do not at all mean to say by that that they are equal " both to all or part of our Lower Coal (or more exactly our " Middle Coal) and your Upper Coal; in my opinion they are " intermediate between the two, and are situated immediately " above our highest beds of the North of France and below " our lowest beds of St. Etienne, Gard, &c."

Of the Millstone Grit few particulars appear to be given in the various treatises on the French and Belgian Coalfield, but in the sections given by Professor Prestwich in his Coal Commission report, he has noted its presence; and in a paper contributed by M. Henry Laporte to the North of England Engineers in 1878, he speaks of certain Grits in the Hardinghem Coalfield as being very like Millstone Grit, with which there is little doubt they are identical.

The Mountain Limestone appears to be invariably present on the Continent, and M. Laporte has described it in descending order as follows:—

Carboniferous Limestone 366 yards	Limestone with *Productus Giganteus* Limestone with *Productus Undatus* Limestone with *Productus Cora*

On this it may be noted, that this formation is thinner on the Continent than in England, where, in the gorge of the Avon its thickness has been estimated at 2,338 feet, and on the Mendips its thickness is apparently even greater.

It may be remarked that for a time it was believed that the Boulonnais Coalfield, which is overlaid by one bed of Limestone and rests upon another, must belong to the Carboniferous Limestone, in which case it would have been the equivalent of the Berwickshire and Scotch Coal Measures; but subsequent investigation has established the fact that this part of the coalfield of France is identical with the general basin of Valenciennes and elsewhere, the Limestone by which it has been overlaid in the Boulonnais area being due to a great physical disturbance of which the writer will presently have to speak.

UNDERLYING FORMATIONS.

In comparing the underlying rocks of Somersetshire with those of the French and Belgian Coalfield, a great disparity is found to exist. In Somersetshire the Mountain Limestone is underlaid by the Old Red Sandstone, which is the oldest rock met with on the Mendip Hills, and the same remark applies throughout the extended elevation of the older rocks which forms the southern boundary of the Forest of Dean and South Wales Coalfields. Those members of the Devonian rocks which appear far to the west in Devonshire, are nowhere met with on the Mendips, and the Silurian, if it exists, lies far out of reach.

On the N. side of the Bristol Coalfield, in the vicinity of Tortworth, which was visited by the Field Club many years ago, the section would appear to be more complete, for the Carboniferous Limestone is there unlerlaid by the Old Red Sandstone, and afterwards by the Silurian.

But in the underlying rocks of the French and Belgian Coalfield the succession of the Palæozoic rocks is much more extensive and complete, embracing in the Ardennes, according to Dr. Hovelacque, the following strata in descending order:—

Upper Devonian	Tamennian
Middle Devonian	Frasnian
	Givetian
	Eifelian
Lower Devonian	Coblentzian
	Gedinnian
Silurian	(Middle)
Cambrian	

Although the Devonians are all represented within the limits of the Coal basin, they are not all invariably present, for while to the S. of the crest of Condroz, in the Ardennes, in the Basin of Dinant, all three divisions of the Devonian are represented, to the N. of the same crest only the Upper and Middle Devonians are present.

The Silurian and Cambrian appear there in certain lines of elevation which must have preceded the deposit of the Devonian and Carboniferous rocks, as these rest upon them unconformably.

PHYSICAL DISTURBANCES.

In former papers contributed to this Society the writer has entered so fully into the great physical disturbances which form so marked a feature in the Somersetshire Coalfield, that it is only necessary to refer to them here for the purpose of comparing them with the state of things which prevails on the Continent.

The Coal Measures of the S. of England having been gradually formed by successive accumulations of vegetable growth, followed at successive intervals by submergences, and deposits of a different kind, were at length broken up by an extended elevation of the older rocks reaching from Pembrokeshire to Frome.

This great axis of elevation, known in this neighbourhood as the Mendip Hills, must, at the close of the Coal Measure period, have formed an elevated mountain chain, the height of which can only be judged from the thickness of strata since denuded from its summit, which cannot have been less than 12,000 feet; and the effect of this great upheaval on the adjoining Coal Measures led to the most remarkable physical disturbances to be met with in this country. The Carboniferous Limestone and Millstone Grit between Mells and Ashwick were raised into a vertical position—if, indeed, they were not folded over—and for a distance of five miles on the Northern flank of the Mendips, the Coal Measures were completely overturned, carrying with them those isolated masses of Mountain Limestone and Millstone Grit at Luckington and Vobster, to which Mr. Winwood has again called attention to-day. The strata of the Vobster and Nettlebridge Valley were thrown into a series of contortions, and the Coal Measures in the interior of the basin were thrust bodily forward to the N., forming the overlap fault of Radstock.

So stupendous have these physical disturbances been that human ingenuity has been largely exercised of late years in endeavouring to get rid of them or explain them away; but, if any doubt on the subject yet lingers in the mind of anyone, it is believed that the still greater physical effects everywhere met with in the French and Belgian Coalfield, a few examples of which the writer would now endeavour to describe, will entirely remove any scepticism which still exists.

In the notes furnished by Dr. Hovelacque, he has given a series of sections across the coal basin at various points, from near Calais, on the W., to Liege, on the E.; but, although these present endless variety in detail, their main features are everywhere more or less the same, so that a few typical examples will suffice.

And in order, first of all, to explain the structure of the foundation rocks associated with the French and Belgian Coalfield, the writer would direct attention to an enlarged copy of a theoretical section of the country around Ardennes.

From this it will be seen that, prior to the Devonian period, there must have been a great elevation of the older rocks, which were thrown up into a series of parallel ridges, four of which appear in this section, viz., the crests of Brabant and Condroz, consisting of Middle Silurian, and two other ridges, consisting of the Cambrian rocks. These appear to have been tilted up at high angles by a great pressure from the S., and, within the intervening valleys, the Devonian and Carboniferous rocks were successively deposited on the upturned edges of the older rocks.

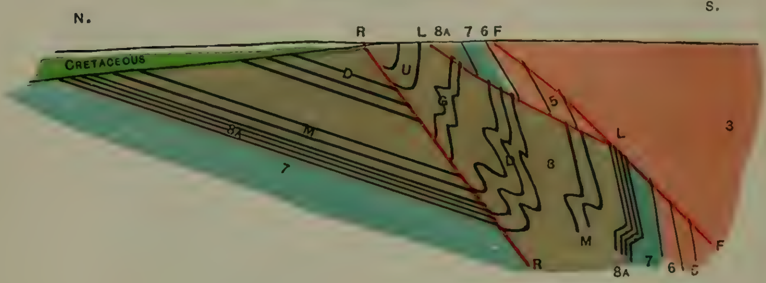
This section illustrates what has been pointed out in an earlier part of this paper, viz., that while on the N. side of the crest of Condroz only the middle and upper Devonians are present, the upper, middle, and lower Devonians are all represented on the S. side of that axis, proving that the basin of Namur was not invaded by the sea during the lower Devonian period.

Towards the close of the Carboniferous formation the entire range of the Continental field from Calais to Westphalia appears to have been the scene of great physical disturbances, the Devonian and Carboniferous rocks having been elevated by a great pressure from the S., and pushed forward towards the N.

NATURAL H.STORY.

No. 1.

Theoretical Section of the Coal-Fields of Belgium and the North of France.



3	Lower Devonian
5	Middle Devonian
6	Upper Devonian
7	Carboniferous Limestone
8 & 8A	Coal Measures
M	Lower Coal Beds
D	Middle Coal Beds
G	Upper Coal Beds
U	Upper Coal Beds
F F	Great Fault
L L	Boundary Fault
R R	Reversed Fault

by the Cambrian and Silurian rocks. The Devonian and Carboniferous beds were first raised up on the summit of the crest and then overturned, the Coal Measures being thus overlaid by the Mountain Limestone, Devonian and even by the Silurian itself.

To explain the movement here described, the attention of the members is directed to a theoretical Section of the Coalfield of Belgium and the N. of France,* which includes most of the distinctive features alluded to, and may be regarded as typical. Beneath a covering of Chalk lie the Coal Measures, which on the N. side of the basin, both here and elsewhere, occupy their natural position with a general dip towards the S., but on the S. side have been folded back upon themselves, throwing the strata into a series of contortions which these sections only partially represent, the Coal Measures being overlaid by the older rocks as already described.

The chief faults associated with this disturbance are three in number, viz. :—

1.—The great fault or "Grand faille" separating the lower Devonian of the Dinant basin from the more recent and overturned strata of the Namur basin.

2.—The "limiting or boundary fault (faille limite)" between what Dr. Hovelacque calls the "scraps of pressure"† and the productive coal beds.

And 3.—The "fault of return or reversed fault (faille de retour)" between the overturned strata on the S. side of the coal basin, and the coal beds which lie in their true position on the N. side, probably corresponding with the overlap fault of Radstock, although differing from it in some respects.

The "Great fault" is evidently the result of the thrust from the S. already referred to, for the movement does not seem to have ended there as in Somersetshire with the elevation and overthrow of the Carboniferous rocks, but has been continued in the form of a fault, the older strata having been forced up an inclined plane in the line of fracture, over the upturned edges of the Carboniferous beds, which they had in the first instance overturned, and occasionally carrying masses of the Carboniferous Limestone with them, as these are frequently met with out of their proper place. The extent of the Great fault may be judged by the fact that in some cases the Devonian beds of the Dinant basin are said to have been thrust Northwards as far as the centre of the Namur basin, where they covered up the Coal Measures, in proof of which many pits in the neighbourhood of Liege have reached the Coal Measures beneath the Devonian.

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* See Section No. I.

† The Devonian and Carboniferous rocks tilted up and pushed towards the N. (Editor.)

To illustrate this it is only necessary to point to a section of the coalfield to the West of Mons,* where the Carboniferous Limestone, as well as the Upper, Middle and Lower Devonian are found in inverted order resting on the overturned Coal Measures, presenting complications which are very difficult to account for.

The Boundary fault, so called because the Coal Measures are bounded by it on the S., appears to be an attendant fault connected with the greater dislocation, but as already explained, not always present with it. The strata lying between these two faults generally consist of Carboniferous Limestone and Devonian, which are separated by the Great fault from the older rocks to the S., and by the Boundary fault from the Coal Measures on the N.

The "Reversed fault" is a line of fracture passing up through the Coal Measures, generally in an oblique direction with a steep rise to the N., but occasionally in a more horizontal direction with a more gradual rise to the N., presenting in such cases a very close resemblance to the Overlap fault of Radstock, with which it is probably analagous.

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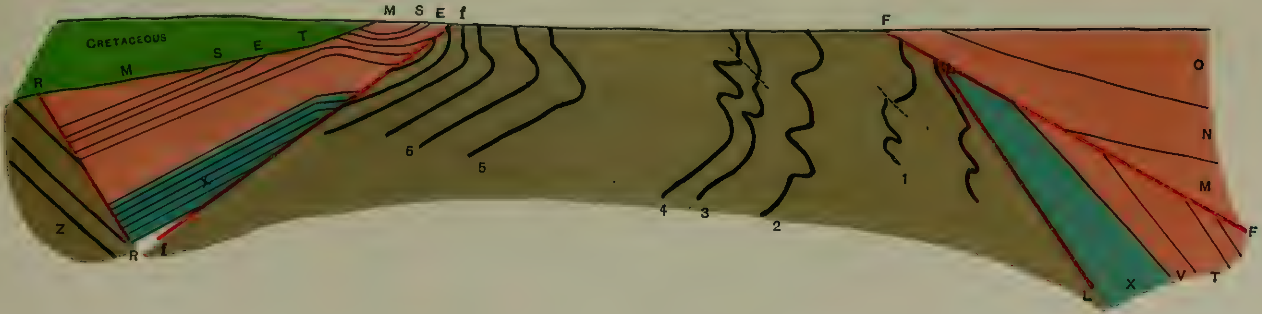
* See Section No. II.

No. 2.

Section of the Southern part of Coal-Field at the West of Mons. (Belgium).



M	.. ..	Lower Devonian
N	.. ..	
O	.. ..	
S	.. ..	Middle Devonian
E	.. ..	
T	.. ..	
V	.. ..	Upper Devonian
X	.. ..	Carboniferous Limestone

Z	.. ..	Coal Measures in position
1 2 3 4 5 6		Coal Beds overturned
F F	.. ..	Great Fault
L L	.. ..	Boundary Fault
f f	.. ..	Fault of Boussa
R R	.. ..	Reversed Fault

NATURAL HISTORY

The same great pressure from the S. which thrust the Devonian and Silurian upwards and northwards in the plane of the Great fault, and which forced the Mountain Limestone and Upper Devonian upwards and northwards in the plane of the Boundary fault, seems to have had a corresponding effect on the Coal Measures in the interior of the basin which were forced upwards and northwards in the plane of the so-called "Reversed fault," causing the coal veins to overlap each other.

Judging from the sections furnished by Dr. Hovelacque, the nearly horizontal form of the "Reversed fault" is rather exceptional, the steep rise to the N. being the prevailing form, the side pressure having apparently expended itself on the Continent rather by causing the older rocks to overlap the Coal Measures, than in forcing the Coal Measures to overlap themselves.

The same crushing effect is said to be observable beneath the "Reversed fault" on the Continent as has been observed in a marked degree beneath the Overlap fault of Radstock, and in other respects the analogy between them must be evident to all observers, although all these physical disturbances on the Continent evidently far exceed in magnitude those of this country.

Coal Prospects in the S.E. of England.

In conclusion it need hardly be pointed out that the subject of this paper has an interest beyond the mere geological problems on which it treats, for it has an important bearing on the question of the possible existence of a coalfield under the S.E. of England.

If on this side the channel there exists a coalfield, broken up here and there by elevations of the older rocks, but still forming one great coalfield, which is bounded on the S. by a chain of hills extending from the Pembrokeshire coast to Frome.

And if there is on the other side of the channel a corresponding range of Coal Measures extending from Westphalia through Belgium and the N. of France to the neighbourhood of Calais, this continental coalfield being bounded also to the S. by a range of older rocks, similar in some respects to that which forms the Southern margin of the English basin.

And if a careful comparison of these coalfields shows that in many essential features they so nearly correspond as to establish their probable identity, it must lead to the hope that in the intervening area under the S.E. counties of England the missing link may yet be discovered.*

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* When the writer penned these words he little thought that within three days the discovery of a Coalfield in the S.E. of England would become an accomplished fact, thus establishing beyond all doubt the correctness of the opinions long held by Mr. Godwin Austin, Professor Prestwich and others, which the writer had the honour of bringing under the notice of this Club in a paper on "The Geographical Position of the Carboniferous Formation in Somersetshire, with Notes on Possible Coal Areas in adjoining districts of the South of England," read 15th January, 1873, and published in the "Proceedings" of that year.

The discovery is due to the enterprise of the South Eastern Railway Company, under the advice of their Engineer, Mr. Francis Brady, and of Professor Boyd Dawkins, who in a boring at Shakespear Cliff, Dover, have reached the Coal Measures.

Full details of this boring have not yet been made public, but in a recent communication to the Manchester Geological Society Professor Boyd Dawkins has given the following particulars of the strata met with:—

		Feet.
1	Cretaceous Rocks	500
2	Oolitic Rock	660
		1,160
3	Coal Measures, Sandstones, Shales and Clays ...	20

and he stated "that a seam of good blazing coal was met with on the 15th February last, at a depth of 1,180 feet."

The public are to be congratulated on a discovery the importance of which can hardly be overestimated.

Summary of Proceedings for the Year 1889-90.

MR. PRESIDENT AND GENTLEMEN,

After the Anniversary Meeting, on the 18th February, 1889, when the machinery of the Club was again started for another year by the election of Vice-President and other officers, the first event to be noted was the afternoon meeting on March 13th, when the last two communications of the Session were devoted to Natural History—the first by Col. Lindley Blathwayt (unfortunately unable to be present himself through illness) and the second by Mr. George Norman. Col. Blathwayt's paper, being a continuation of that read on 8th February, 1888, on Hemiptera-Heteroptera taken in the neighbourhood of Bath, and consisting of a list of those Plant "Bugs," which he had collected in the district, and was ready to place in the Institution so soon as there was a cabinet to receive them, was printed in the last number of the "Proceedings." The total number of species he has collected amounts to 65.

Mr. NORMAN contributed some useful notes on the Duncan Local Museum. At the outset he stated they were not original, but merely collected together from other sources; tending, however, to make better known—what was hitherto so little known—the admirable collection of local natural history brought together by the loving industry of their venerable President. (*Vide* "Proceedings," Vol. vii., No. 1, p. 1).

The Rev. E. T. STUBBS, who presided in the absence of the Chairman, Mr. Skrine, thanked Mr. Norman for the trouble he had taken in putting together these notes, and having the various specimens alluded to brought down for inspection. The study of Natural History was at all times interesting, and such notes as these, whilst serving to illustrate what the Museum already had, also served to indicate what was wanting in the local collection. With reference to the remarkable size of the jack snipe's eggs he stated that the bird always laid four eggs, and that the small end of each egg being slightly less than a right angle they were so arranged by the bird as to enable her, small as she was, to cover the whole four.

Dec. 18*th.* The first afternoon meeting of the Session 1889-90 was inaugurated by a Paper from the venerable President, on "Some Peculiar Odours. common in certain instances, to both Animals and Plants." Conspicuous as all his papers are for the lucid and scientific treatment of their subjects, this one might be said to be especially noted for the clear way in which a very difficult question was treated, *i e.*, the origin of those odours peculiar to both animals and plants ; and those present were much gratified to find that advancing years had by no means dimmed the lustre of his intellect, and that he was able once more to lay before them the results of his reading and research. (*Vide* Vol. vii., No. 1, p. 13).

The Chairman, Canon Ellacombe, heartily thanked Mr. Bloomefield for his most interesting communication, the title of which but little indicated the particular line to be followed. Whatever came from his pen must be of value to the members of a Club like theirs, knowing with what wisdom and vigour he still followed out his scientific pursuits. It was a privilege to listen to such a paper, prepared, too, as it must have been, with no slight labour. The subject of the intimate connection between the animal, vegetable and mineral kingdoms, was a very interesting one, and the words of the dramatist, that "Nature has made the whole world akin," were truly applicable.

The second afternoon meeting on 15th January was given up to Mr. Emanuel Green and Canon Ellacombe. The former added another useful page to local history, and read a paper on "Bath Old Bridge and the Chapel thereon." (*Vide* Vol. vii. No. 1, p. 25 and 34).

Canon Ellacombe, who presided, while regretting the somewhat small attendance of members, thanked Mr. Green for his valuable communication to the club. He agreed with Mr. Green that the buildings on bridges were more houses for the poor to turn in and rest rather than chapels. He thought that Mr. Green was in error in stating that the only known examples of a bridge with a chapel were at Bradford-on-Avon and Bath, as there were examples at Rotherham and Wakefield, and in other places in Yorkshire and Lincolnshire.

The Rev. H. H. WINWOOD also thanked Mr. Green for his paper, and for the light which was thrown on this period of local history by his researches and communications to the Club. He inquired whence Mr. Green obtained the views of the Bath Bridge, which he had exhibited, as it had been a matter of controversy whether there was any building on the bridge at all. These drawings, which were hitherto unknown, settled the question, and he was curious to know where they were found?

Mr. GREEN, in his reply, said that the building on the Wakefield bridge was a chapel in every sense of the word, and could not be compared with the oratory on the Bath and Bradford bridges. In reply to Mr. Winwood, he stated that he found the views in the British Museum among a lot of uncatalogued drawings.

Canon Ellacombe's paper on the "Vineyards of Somerset and Gloucestershire" concluded the meeting, and was another contribution to the question whether the word "Vineyards," so common in the two counties and elsewhere really meant what we now understand by the word? Mr. ELLACOMBE thought that evidence, historical and otherwise, tended to the conclusion that grapes were really grown on these spots, and that wine was manufactured from them, and remarked that the Field Club might add to the many other points observed in their walks, evidences that they met with of the existence of these ancient Vineyards.

A short discussion took place afterwards, in which Dr. MANTELL, Rev. H. H. WINWOOD, Messrs. E. GREEN and HOLST took part. In replying, Canon ELLACOMBE said he thought the vines that used to be cultivated in this country were a hardier kind than those known at present, and that they grew more like currant bushes. His opinion was that the cultivation of vines in England had died out more on account of the greater facilities for obtaining cheap foreign wines than for any change in the seasons experienced in this country.

The third afternoon meeting (Feb. 13th), was devoted to Geology. The SECRETARY gave an account of the results of some of his late Autumn rambles in the neighbourhood, under the title of a "Rhætic Section at Luckington, and additional Notes on the Vobster Limestone." The first portion of his remarks had reference to the discovery of the further extension, southwards towards the Mendips, of the Rhætic formation lying on the denuded edges of the Carboniferous Limestone, a fine example of unconformity for which this district is so remarkable. The second had reference to a former communication made to the Club in 1882 respecting the inversion of the Mountain Limestone at Vobster, and the finding of the Millstone Grit there *in situ*. Since then the section had been further exposed, and more beds of Grit opened out, and through the kindness of Mr. Batey a plan of these extended excavations has been made and placed at the disposal of the Club. (*Vide* Vol. vii., No. 1, p. 45).

Mr. McMURTRIE followed with a most interesting and carefully prepared paper, in which comparisons were drawn between the Coal Field of Somerset and the Coal Measures of Belgium and the N. of France. During the visit of the British Association to Bath in 1888, Dr. Hovelacque, one of the Foreign Geologists, had accompanied him in several walks around Radstock, and had recently sent him some valuable notes upon which he had founded his present paper. Illustrated by Mr. McMurtrie's usual admirable sections it was a very important contribution to Geology, showing how the disturbances of the Strata for which our district was so noted were not only equalled, but even surpassed, by the dislocations, over-thrusts and inversions, with which the Belgium and N. of France Coal Fields abound. (*Vide* Vol. vii., No. 1, p 49).

The attendance at the afternoon meetings might be more encouraging to the readers of papers, the largest number being 20 for the President's paper. The average number has been 13, the total attendances during the four meetings being barely 16 per cent. of the whole Club.

EXCURSIONS.

Sudbrook and Caerwent.—Tuesday, April 9th, opened most unfavourably for the first excursion of the season; thirty-six hours of continuous rain had been falling, and it was naturally thought that the usual good luck of the Club in weather might be looked forward to, and that the succeeding twelve hours would prove fine. Such, however, was not the case; down came the rain for another twelve, though not quite so heavily as to preclude the day's programme from being carried out. The muster at the station was not so large as might have been expected from members of a Field Club, and fourteen only answered the secretary's roll call, nine others who ought to have appeared being faint-hearted enough to prefer their own firesides to the healthy action of the rain, supposed to brace up the nerves and energies of Englishmen, and to make them the hardy and enduring race they once were. Those, however, who did join, had no reason to regret it, and the damp outlook of rolling river and flooded meadow-land was quite interesting when viewed from the interior of a comfortable saloon carriage, which through the kind efforts of Mr. Graham the authorities of the G.W.R. put at their disposal by the 8.30 a.m. train to Bristol and the Severn Tunnel Junction. An admirably horsed break and pair, with another single-horse vehicle, provided ample accommodation for the party as they left the train at the latter station, at 10.17, and rattled them through an undulating country; passing by

Dewstow and Brockwalls glimpses only of the channel from the former, and of the distant hills of Shirenewton and Grey hill from the latter, indicated what a wide panoramic view might have been seen would only the leaden haze have lifted for however so short a time. But it might have been worse, and the rain, which was only slightly falling, might have been heavier, and so the disappointment was cheerfully borne. Arriving within sight of the walls of Caerwent, the Rector, the Rev. T. D. Jones, was seen waiting at the "Caerwent brook;" and having taken a dry seat placed at his disposal, with energy by no means damped by the rain, acted as the guide philosopher and antiquarian friend of the party, and pointed out all the objects of interest as they passed along. The road on the E. and N. follows the line of the ancient ditch, and pieces of the old wall are seen here and there on the left hand through the overhanging bushes and trees which almost conceal it, but act at the same time as a protection from the pilfering hands of the inhabitants who are only too ready to appropriate the ready squared Roman blocks for their own needs; the whole of the village (now nestling within the ancient walls which enclose a space of about a mile in circumference) has been built out of the ruins of the old city. The squared limestone blocks, forming the facing of the walls, have generally been stripped off, exposing the rough inner core, and only on the S. can they be seen in perfection. Here they rise to a height of some 24ft., and are 12ft. thick at the base and 9ft. thick at the top. Entering the village on the west by the Via Julia, which intersected the ancient Venta Silurum at right angles and connected it with Caerleon and Chepstow, the first halt was made at the church. Dedicated to the first martyr, S. Stephen, Mr. Jones stated that it was the oldest ecclesiastical foundation in Wales, and called attention to the curious arcading on the S. wall of the chancel, a veritable *crux antiquorum*. The form at present is merely that of a tower at the W. end, with nave and chancel.

Could these arcades on the S. have once lead to a side aisle or chancel, and in later times been filled up? The low arches seem to be of much older date than the walled up space below them. The chancel is the oldest part of the church, probably 13th century. The pulpit is a good specimen of 17th century work, and the small silver chalice, date 1577, is very elegant in shape. The tower, with turret staircase, on the S. side, has perpendicular belfry windows, but the base appears to be of much more ancient work—maybe Norman. Amongst other bits of local lore, the Rector alluded to a stone stile leading to the Church of Llanvair Discoed* (the Church of S. Mary below the Wood), whereon was cut the following :—

Whoever here on Sunday
  Will practis playing at ball ;
It may be before Monday,
  The devil will have you all,—

an allusion to the game not infrequently carried on against the church towers or walls, sometimes even during service time. Amongst other things, too, the Rector said that evidently the site of the church was once the highest point within the old walls, and, that the ground, though risen since, formerly sloped away in all directions from it. In an orchard to the N. of the church the Roman bath, now at Caerleon, was found. Quantities of *tesseræ* and Roman coins are unearthed from time to time, and a fine specimen of Roman pavement was found only a year ago, in a garden of the Coach and Horses Inn, but is now covered up again. Having seen as much of Caerwent as was possible under the circumstances, the Via Julia was followed to Crick, and evidences of the late heavy rains were seen in the flooded state of the Neddern, to the S. of the old walls. A few more feet of water, and might it not be possible for boats to come up close to them, as tradition asserts once was the case in Roman times? Leaving the main road at Crick—the etymology of which word Mr. Jones considered to be Carreg,* and not in any way connected with Crik or Creek—a vicinal way was followed to the south, leading to Portskewet. The cropping up of Mountain Limestone on the left, with its wooded spurs and retreating coombes, forms a portion of the picturesque estate of Ballan, recently purchased by Mr. Walker, the distinguished contractor of the Severn Tunnel works, whose house was passed on the right hand Having landed Mr. Jones at the rectory, not before very hearty thanks were returned to him for his courtesy and kindly guidance during the morning, the members, having nothing to detain them in the village of Portskewet as they had visited it last year, found themselves landed rather earlier than was expected at the Black Rock hotel. The two hours before lunch were most profitably spent by an inspection of the G.W.R. pumping works, under the guidance of Mr. Hosken. Some of those who were not present during the visit of the Club last year went down the pumping shaft, and saw the water of the great spring rushing by beneath their feet, looked in upon the magnificent pumps, doing their work so noiselessly and efficiently, the many boilers, and the revolving fan. How few realise, whilst speeding through the tunnel so easily and comfortably, how much is going on above ground to insure their safety! whilst others, under the guidance of Mr. Beetlestone (Mr. Walker's deputy), were conducted to a quarry adjoining, where recently, whilst excavating sand, a very curious geological feature had been disclosed. After clearing away the top heading of gravel and sand, some 10ft. thick—apparently from the nature of its contents and the position of the pebbles, indicative of glacial origin—the surface of the yellow sandstone beneath was found perfectly honeycombed with pot holes of every shape; from perfect circles to oblong, oval and pear-shaped depressions, some three or four feet deep. Some of these were worn out in the line of a weakness or joint. Were they formed by ice, water, or by chemical decomposition? Had any pebbles been found at their base, the solution of the problem might be guessed, but in every case nothing but sand derived from their sides filled them up to the brim. Unfortunately, the amateur photographer, who was prepared to take them, was unable to do so owing to the weather. The same curious cylindrical holes are seen on the foreshore; and wherever the present water of the Severn has washed off the superincumbent soil the yellow sandstone is seen riddled with them. Mounting from the foreshore to the interior rampart of Sudbrook Camp, some thirty feet high, the outline was followed to the little chapel, built in the ditch at the S.E. end. Composed of three ramparts, the inner one being the highest, it plainly takes the shape of a stretched bow, as some have described it, and was never square. Though the waters have encroached very much, and eaten into the two ends of the bow, the means taken by Mr. Walker to prevent further enroachments have been successful; the great mass of rubbish which he has "tipped" forms an effectual barrier both to protect the camp and the chapel, together with the graveyard which, within the last few years, was being gradually washed away. Now a railing surrounds it, and there is a considerable distance of made ground between it and the Severn. Returning to the hotel, the members were not sorry to finish their day with a good lunch, and afterwards left Portskewet for Bath by the 4.56 train, none the worse for the unpropitious weather.

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* *Llanvair* = St. Mary
is = below
by = the
Coed = wood.

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* Crick is a corruption of *Crig* derived from *Carreg*, a stone. *Crig*, *cairn* (Scotch), *carn* (Welsh) = heap of stones.

Winchester Cathedral and St. Cross.—The second excursion of the season was on Tuesday, May 7th, the places selected to visit on this occasion being Winchester Cathedral and College, and the Hospital of St. Cross. Sixteen members of the Club left Bath by the 8.51 train in a saloon carriage, placed at their disposal by the courtesy of the G.W.R. authorities, and thus travelled through to their destination without the inconvenience of changing. On reaching Winchester, the secretary not allowing any halt for refreshment, the party proceeded direct to the Cathedral, passing the old City Cross, and through the old-fashioned corridor to the W. entrance, where the Rector of St. Michael's (the Rev. H. E. Moberly) met them and acted as their guide to all the interesting features of the building. Passing round the northern side, he gave a short account of its architectural features, pointing out the works of the various bishops, including that of Walkelin, Henry de Blois, and William of Wykeham. The party then entered through the S. transept door, opposite the elaborate tomb of Bishop Wilberforce. Nave, choir, transepts, lady chapel, chantry chapels and tombs were successively visited, and last, but not least, the crypt, the most ancient part of the structure, dating certainly from the 11th century, if not earlier. The present Dean, a distinguished archæologist, has lately had the whole of the floor of the crypt cleared of an accumulation of earth to a depth of four feet, thus exposing the bases of the Norman piers, before hidden, and bringing to light many important features. After two hours thus spent, admitting, however, only of a very cursory glance at the many unique architectural details in this, one of the most important cathedrals, the members proceeded to the College. The boys being away on their holidays, there were no masters present, and so the secretary, an old Wykehamist, conducted the party over the buildings, and explained the various points of interest, not forgetting the way in which the boys were "flogged" in his day. The chapel was first visited, afterwards the cloisters, on the walls of which are tablets to the memory of boys who have died in the school, or who have distinguished themselves after leaving. In the old schoolroom, now used as a music room, is preserved a table, on which the late Sir Herbert Stewart burnt his name with a red-hot poker, when a member of the College, for which he duly received punishment. The dormitories, the dining hall, the second chapel, and the playing meads were all visited in turn, and the curious painting of the "Trusty Servant," in the small room adjoining the kitchen, was inspected. A strange sight met the eyes of the visitors on entering the quadrangle, namely, a party of old women seated on short-legged stools, picking out from between the paving of flints the vegetation which had grown there. On leaving the College, the party proceeded through the meads to the Hospital of St. Cross. Here they were received by the Rev. W. G. Andrews, the master, and, having partaken of the *dole* of beer and bread at the Porter's Lodge, were taken by him over the Hospital and Church, the latter probably one of the best specimens of Transition work to be seen in this country. The hospital now consists of thirteen brothers and four noble brothers, the latter being a revival of Cardinal Beaufort's foundation of "noble poverty" for the relief of men who have occupied superior positions in life. The hall was last inspected, and attention drawn to the black jacks, wooden salt dishes and candlesticks, now preserved in a glass case, and also to the *triptych* at the E. end, which is ascribed to Dürer. Having lingered as long as possible amidst the picturesque surroundings of the ancient Hospital, the party returned to Winchester for a little necessary refreshment before starting on the homeward journey to Bath, which was reached at 9.8, after a rather tiring four hours' ride, owing to the numerous stoppages. The day's excursion was much enjoyed.

Badminton.—Owing to the absence of the Vice-President from England, the Ford Abbey excursion fixed for June 4th was postponed, and a visit to Badminton substituted. The day was lovely, and the country looked beautiful, but the drive there and back, in a break calculated to *hold* 30, but to *seat* only 24 uncomfortably, was not so pleasant as it otherwise might have been. The two and a half hours' drive having been accomplished, the Portcullis Inn received the party, glad to leave their cramped position, and to recover the use of their limbs amid the shades of Badminton. The hour and a half before lunch was spent in a visit to the Duke's far-famed kennels and stables. The hounds, 24½ couple bitches and 18 couple dogs, looked splendid, as the huntsman showed them off in the yard. Keen eyes and well clean shaped fore limbs seemed quite ready for the next season. How the foxes must enjoy being followed by such shapely and well-bred aristocratic dogs! And then the little fox terriers, who trotted out in their midst, looked also proud of their associates, and showed, by scarred nose and other evident signs, that they had taken their share of last season's sport. The stables came next, and here many a "weight carrier" was seen bearing the marks of past work—fired legs, poulticed feet, scarred flank, spoke volumes of many a "going straight" for stone wall, and post, and rail, and long gallops over heavy ploughs. It was quite a hospital for the lame and wounded. A walk through the kitchen garden alone remained to be done before lunch. Nothing particular was noticeable here. The vineries seemed fruitful, as far as a glimpse through the glass indicated, admission not being granted to the interior of the houses—a wise regulation, doubtless. After lunch, excellent in every respect save one—the absence of "spring violets" in the salad (it seems that there had been a failure in this useful and much relished edible), the members by previous arrangement met at the house at 3 p.m., when they had been given to understand it was convenient for the housekeeper to show them over the rooms unoccupied by the family. For some reason or other inexplicable to them, admission was not to be had to any place beyond the passage adorned with antlers of deer, &c., and the "still" room. Having waited here in vain for nearly 20 minutes, they left as wise as they came, so far as the interior of the house was concerned. Intentional discourtesy could hardly have been meant. A wander, however, through the magnificent park to the foot of the Three Mile avenue, with Worcester lodge in the distance, glimpses of deer browsing beneath the finely grown trees, glints of the distant May trees in full bloom, and the soothing pipe allayed their ruffled feelings. Finally, a visit was made to the church, where repose the ashes of noble Dukes and Duchesses, Lords and Ladies, beneath marbled urns and sculptured figures, allegorical and otherwise. A plain marble memorial on the S. wall, erected to the memory of Lord Raglan, of Crimean fame, interested much the military members of the club. Badminton was left at 4.45, and the unpleasantness of the morning ride repeated, with the addition of the breaking of the shoe chain on descending Swainswick hill.

The excursion fixed to Ludlow Castle for the 9th and 10th of July did not take place for some unexplained cause, but two by-excursions are worthy of record, one to Cadbury Castle on 27th of August, and the other to Beckhampton on 22nd of October.

Cadbury Castle, Tuesday, 27th August.—St. Swithin having most completely verified his character as the watery saint, and the forty days rain ceased at last, the morning of Tuesday, 27th, broke fair and fine upon the small muster of the Club at the 10.26 a.m. train for Sparkford. Arriving there about 12.30 a start was made for N. Cadbury. The pinnacles of the fine tower half hidden by the trees was the only portion of the church visible until mounting some steps leading to a field out of a lane with high banks, the beautiful proportions of the fabric suddenly burst upon us, the handsome 16th century manor house closing in the view on the S. The Rector, the Rev. W. Castlehow, met the party at the N. porch, and showed them over the church, pointing out the various objects of interest. Dedicated to S. Michael the Archangel, and rebuilt by Lady Botreaux in the year 1417 or 1427, the structure is remarkable for the admirable state of preservation of the stone work throughout, a mixture of Oolite from Littleton, and Lias. The action of the weather, generally so destructive to the Lias, which constitutes the greater portion of the stone work, does not seem to have had the usual effect here. The N. and S. porches have a parvise chamber over them, approached by a stone staircase on the E. side, the stone capping of which forms a picturesque feature in the general outline. The nave, N. and S. aisles, and the western tower, are lofty and well proportioned, the N.E. buttress of the tower is seen in the inside of the N. aisle indicating that the latter has been built subsequently. At the E. end of the chancel are two lofty canopied niches, 10ft. high, and 2½ft. wide, with pedestals for statues, which must have been unusually high, the pannelled bench ends, with the date 1538, are some of them very grotesque, representing trades (that of a miller, for instance), the emblems of the Passion occur on some, and a figure of a Saint, probably St. Michael. In the inner vestry on the wall the letters of the alphabet are painted up, possibly for the use of the school or choir in mediæval times. Beneath the tower are the tombs of Lord and Lady Bottreaux and others, and a brass plate in commemoration of "Ladye Magdalen Hastings, wife to Francis Hastings, Knight, who departed this vaine and transtiory life the 14th June, 1596," after a lengthy and poetical description of her virtues, are the latin words, "Vivit post funera virtus." On the outside of the tower, and forming the labels of the W. door, are the heads of a knight and his lady on the S. and N. side respectively, these may be the heads of the foundress who is on the dexter side, and her husband. One of the members present, who formerly lived in the neighbourhood, related an authentic story of a cat having been thrown off the tower 72 feet high, and, to the surprise of all, seen to run away afterwards quite unhurt. Before leaving the church an examination was made of the outside stone work for the purpose of noting the masons' and other marks, besides a variety of crosses, single, double, within squares, and without squares. On the N.W. buttress of N. aisle was a spot circle with four radiating spokes or rays, some of the latter extending beyond the circumference. From its position on the N. side the idea of its being a sundial does not carry weight. On the S. side, an old altar slab with consecration crosses, found during some alterations in the interior, rests against the wall. S. Cadbury Church dedicated to St. Thomas à Becket, about a mile to the S., was next visited; standing on the slope of the well-wooded Castle hill, its situation is very picturesque, and all its surroundings betoken a reverent care. A nave, S. aisle, chancel and S. porch with W. tower, and outside wooden staircase, the latter being admirably adapted inside for a pulpit on the N. wall, are its chief features. The moulding of the E. and W. shafts in the S. aisle are somewhat peculiar for Perpendicular work. In the S. E. corner the jambs of an early English window, with the figure of an ecclesiastic (a Bishop), supposed by the Rector to be Thomas à Becket to whom the church is dedicated, the form of the mitre agreeing with this date, has been opened out, the jamb of a later window having hitherto obscured it; beneath are the defaced remains of a piscina, indicating the site of an original altar or 13th century chapel. A painted window in the S. side of the chancel, representing the Annunciation, and dedicated to the memory of "Grace Bartlett, 1858," attracted much attention, the female figures being most graceful and the faces, probably intended for likenesses, much admired. Outside on the S.E. corner of (S. aisle) was another spot with divergent rays, six or seven of unequal length radiating from S. side of centre. A freshly cut semi-circle surrounding the lower half either indicating what originally existed, or else due to the imagination of the first discoverer. Some fainter lines were irregularly interspersed, making in all 10 or 11 rays. Leaving the church on the right hand, a narrow lane, probably an ancient British trackway, led up to the N E. entrance of the camp, guarded by a locked gate and janitress. Permission having been previously obtained from Mr. Wentworth Bennett of N. Cadbury, and the visitors' book duly signed, the members were permitted to wander at their own sweet will, soon losing their way amid a maze of underwood and nettles filling the bottom of the ditch on the N. side. Owing to these obstacles, and the steepness of the scarped sides, it was necessary to beat a retreat, and reach the top by a more easy way. Crossing the level platform of the hill to its N.W. corner, a magnificent prospect was spread out, extending from the Mendips on one side, round by the Quantocks to the distant Blackdown hills of Devonshire on the other, with a richly wooded plain at their feet, amid the foliage of which many church towers stood picturesquely out, the Torr of Glaston being prominent amongst the others. A halt was called at this point, whilst the advent of a certain member was anxiously expected, to whom had been entrusted (in the unfortunate absence of the Rev. J. E. Bennett) a paper written by the latter on Cadbury Castle. The nettles and the deep ditch were, alas! the sad cause of detaining the paper and its custodian, and the Secretary was, therefore, under the necessity of giving a short description of the camp in their absence. After alluding to a former visit of this Club to the neighbourhood, now more than 20 years ago (1868), he said that the growth of the underwood had been such in the meantime as to render the identification of the different points very difficult, and he much regretted the absence of the Rector of S. Cadbury, who would have been such an admirable guide to the party, and who knew more about the Camp than anyone else. Before, however, taking up the later history, which Mr. Bennett had recently so admirably worked out, he would call their attention to the very great strength of the position. In those early times before history was writ there was not any doubt that this hill was occupied by the Neolithic folk. With its fourfold ditch and rampart enclosing a level space on the top of some 20 acres in extent, it was probably merely a military stronghold, to which the prehistoric people retired when the lowlands beneath were harried by tribal quarrels, and a very commanding site it was, well nigh inaccessible from all sides, as the almost precipitous slopes even now up which they had toiled to the top bore witness. That it was formerly used by these prehistoric people a fine polished stone axe recently found by Mr. Bennett was amongst others a sufficient proof. Coming down to more recent and historic times, of course the Romans who always wisely took advantage of the strong positions of those who had preceded them were here, and picking up the thread of Mr. Bennett's paper he alluded to the latter's discoveries in several hut dwellings excavated by him on the hill, whence he had obtained a bronze bracelet, some broken querns, Roman coins (the latter chiefly on the E. side), one fragment of Samian ware, a tile or brick which might be Roman, and various pots, &c. The importance, however, of this stronghold he considered to have culminated some 290 years after the Romans left Britain, when (following the local tradition) King Arthur held his court here, for he agreed with Leland and other early writers in considering this to be the Camelot of ancient Bardic song. Many arguments were put forth to strengthen this theory; firstly, the traditions which hung around the spot, *e.g.*, the idea that King Arthur rode round the hill on silver-shod steeds during the full moon—indeed, one of the silver horse shoes had been found in the track!—one of the two wells was "King Arthur's Well" on the E. face—an early British road leaving Cadbury by its W. gate, going straight for Glastonbury, a bridle path in his (Mr. B's) recollection, the trace of which is now nearly lost, was called by the natives "King Arthur's lane." Secondly, the name of Camelot, surviving in the Camels (W. Camel and Queen's Camel) and the fact that Camulus was the Celtic Mars, or God of War. These, and such like arguments, were cleverly used to strengthen the idea that they were now standing on no less a place than the Arthurian Camelot, the scene of King Arthur's last stand against the West Saxons.

The anxiety of the members having been relieved by the reappearance of their lost brother, after an inspection of the peculiar band of cherty Inferior Oolite on the brow of the hill, a rapid descent was made through the main S.W. entrance, the road finally gained, and the Sparkford Inn afforded a welcome retreat after the long walk and the various accidents of the day. Time did not admit of a visit to the section at Queen's Camel, and only one of those present remembered how, in 1868, the late Charles Moore conducted the Club to his typical section of Keuper, Rhætic and Lower Lias, so admirably exposed in those days bed by bed, but now much grown over and obliterated. Eheu! fugaces labuntur anni!

Beckington and the "Devil's Bed and Bolster."—After a week of wind and rain, in the midst, too, of a depressed barometer (the mercury standing at 29in.), the weather of Tuesday, October 23rd, luckily proved favourable for the second bye-excursion of the Club. Twenty out of the twenty-four members who had sent in their names to the Secretary mustered at the G.W.R. station for Frome, at 10.28 a.m. As the train wound leisurely through the Warleigh Valley, ample opportunity was afforded for the eye to rest on the lovely woodlands, clothed in rich browns and golden yellows and all the intermediate tints from light to dark green. Various questions were asked *en route* as to the chief object of the day's excursion—the "Devil's Bed and Bolster"—the general idea being that some extraordinary geological formation, in some way connected with the Plutonic regions, was to be seen. This pleasing uncertainty helped to keep up the spirits of the party as they turned out from the train at Frome, and wended their way by Wallbridge, Stiles Hill, Fromefield, and along the main road to Beckington, where the first halt occurred. The Rev. J. B. Medley, Rector of Lullington, who had kindly undertaken the description of the Church, met them here, and at once proceeded to read some notes prepared for the meeting of the Wilts Archæological Society in August of the present year. Commencing with a quotation from the "Church Rambler," Vol. II, p. 132, he said, "Beckington is now an ordinary agricultural village—what has it been? A strong castle almost as old as the Conquest; the birthplace of one of the most celebrated bishops of the Diocese; a resting place of Charles II. in his flight from Cromwell's 'crowning mercy,' the Battle of Worcester; and a notable centre of the W. of England cloth manufacture." There was, therefore, no necessity to manufacture subjects of interest *ex more* one Samuel Pepys. The first family of note here after the Conquest was that of the Erleighs or de Erlega. John de Erleigh was the first of that family known to have settled here in 1161. A John de Erleigh died in 1338, seized of the Manor of Beckington. Through this family, by a series of marriages, it passed into the possession of the St. Maurs or Seymours and the Bampfyldes, until, in the early part of the 16th century, the manor was purchased by John Ashe, Esq., from whom it passed to the Methuens and to the present lord of the manor, Rev. Henry Sheppard. According to the Register dating from 1559, it appears that the Cross was taken down in 1775, and that Charles II. and Catherine, his wife, rode through Beckington on the 10th of September, 1663, also that George III. with his Queen Charlotte, passed on their way to Longleat, on the 15th of September, 1785. There are several fine monuments and brasses in the Church. In the N. wall of the chancel are two canopied altar tombs. The most Eastern of the two is assigned to John de Erleigh and Margaret, his wife, 1380—1400. The single female figure in the other, is supposed to be another member of that family, date 14th century. In the floor of the chancel a brass, representing John Seymour and Elizabeth, his wife, is in good preservation, and bears the following inscription:—

Hic jacet John̄es Seynt Maur Armig,
et Elizabeth uxor ejus
qui quidem John̄es obit
v Die Octob. A.DM
1385.
Cujus an̄e p̄p̄icietur D. Amen.

In the vestry floor a later brass to the memory of John Compton, 1501, represents himself and wife, with their five children beneath; on either side is the figure of an angel, with the monogram, a tun or barrel, upon which are the letters "J. C." In the N. aisle a tablet to Samuel Daniel, d. October, 1619, records that "the dead body of Samuel Danyell, Esq., lyes expectinge the second coming of our Lord and Saviour Jesus Christ, that excellent poete and historian who was tutor to the Lady Anne Clifford in her youth," and by whom, when she was Countesse Dowager of Pembroke, Dorset and Montgomery, this monument was erected. Among the Longleat letters are two to Mr. James Kirton from Samuel Danyell, poet laureate temp., 2 Elizabeth. His chief poem was on the Wars of the Roses, and of his poetry Michael Drayton writes—

> His runes were smooth, his metres well did close,
> But yet his matter better fitted prose.

He also wrote a History of England to the end of the reign of Edward IV. There are several monuments also to the Edgell family, owners of Standerwick Court. Thomas Beckington, son of a weaver, a Wykehamist, private secretary to Henry VI. from 1438 to 1443, and the famous Bishop of Bath and Wells from 1443 to 1464, to whom, amongst other things, the inhabitants are indebted for their conduit in the Market place, is reported to have been born in this village, hence Leland—

> Beckingtona mihi dedit ortum;
> Balnea, Fontes
> Fasces.

The church, restored by Mr. J. B. St. Aubyn, brother of a former treasurer of our Club consists of a nave, chancel and side aisles, with a fine tower at the W. end. In the N. aisle are remains of a reredos and piscina. There is another piscina and ambery in the S. aisle, a N. and S. "squint," two doorways leading to a rood loft, one in the N. wall of the chancel, another in the E. wall of

N. aisle. The wooden roof of the nave is good 15th century work, to which date the rest of the architecture belongs, with the exception of the tower which is late Norman, as shown by the fine stone pannelled belfry windows. Indications of Norman work having been utilised in the 15th century appear everywhere in the walls (which are left in their rough state, a cold look being the result), especially in a pretty piece of pannelling on the outside of the S. wall. Some good herring-bone work, coeval with the tower, is seen at the base of the S. wall of the chancel, also in the vestry. The N. porch has been considerably altered, and the present wooden roof lowered in Perpendicular times as there are evident traces of a room or parvise chamber having formerly existed above. Two curious Perpendicular corbels supporting the roof are seen on the inside of the N. aisle projecting on each side of the window jambs. A Sanctus Cote is on the outside at the junction of the chancel with the nave, and a curious angular buttress built against the middle of the N. wall of the tower between the two flat Norman buttresses, probably for support at some later period. Attention was directed to the following epitaph on a plain tombstone in the churchyard at the S. E. end of the church, stated by the Rev. Wynter Blathwayt, present Rector of Dyrham, to have been erected by his uncle :—

A. S. B. died 14th Jan., 1840, aged 10 days.

The cup of life, just to her lips she prest ;
Found its taste bitter, and denied the rest.
Averse then turning from the light of day,
She softly sighed her little life away.

Another version—

Just to her lips the cup of life she prest ;
Found the taste bitter, and refused the rest,
Then gently turning from the face of day
She sweetly sighed her little life away.

Mr. Medley asked whether the author was Southey? The fine gable-ended house passed before coming to the Church still bears the name of the Castle, and was probably built by the Erleighs, certainly inhabited by them. After lunching at the Woolpack, a name indicative of the staple trade once existing here, Mr. Medley gave a short anecdote of that "quaint but uncomfortable" man, Samuel Pepys, who seems to have passed through in 1668. The Secretary then, in the name of the Club, thanked him for his kindness in acting as guide and instructor, alluded to his readiness to impart information whenever called on to do so, and asked him to lead them at once to the chief object of the excursion, which they were all so anxious to see. Passing down the village, a turn to the right brought them to "Goose," *i.e.*, as some interpret, "water" street. Opposite the fine old Elizabethan Manor House, with its porch and walls resplendent in autumn tints, called Seymour's Court, a halt was called, whilst leave was obtained from the tenant, Mr. Crees, to cross his fields to a clump of fir trees seen about a quarter of a mile distant on the left. On a rising ground, somewhat oval in shape and now covered with fir trees, stood the object of the day's walk. Standing on an elevated hump of grass, evidently covering something beneath, and in full view of the Wiltshire Downs and the White Horse to the E., Mr. Medley gave the following account:—Some time since, in August, Canon Jackson sent him a drawing made in 1838, representing a "stone circle" somewhere in the neighbourhood of Beckington, and asked him to ascertain whether such a thing really existed, as he failed to find it laid down in the ordnance maps. After making enquiries he (the speaker) learnt from Mr. Millett, tenant of Prior's Court, that there were some old stones near Seymour's Court, called the "Devil's Bed and Bolster," and was taken to the present spot by his informant. He was also informed by another inhabitant of the place that at one time it was twice as large as it is now, adding the tradition that when people had tried to take the stones away, bad weather had always prevented them. Further explanation of what they saw he must leave to others. The Secretary said that to Mr. Medley was due a very important discovery, or re-discovery, of what he ventured to state had evidently been a long tumulus or barrow, now fallen in and much disturbed; the shape of the rough ground forming the "bed" indicated its object, and the name given by the natives pointed to some such use as a burial place. The large stones that remained were all Sarsens, and never grew on the spot, but had probably been brought from the Wiltshire Downs seen in the horizon. The upright stone at one end may have formed one of the circle surrounding the tumulus of which the others had been destroyed. The length of the mound or ridge running S.S.E. and N.N.W. measured 50ft., and the breadth at right angles 62ft., so that there was a space of some 1,033 sq. yds., somewhat elevated above the general level of the field, covered with stones more or less exposed. From a rough calculation, the number of Sarsens lying about was 22 or 23. Five of these were upright, three or four at the E. end, and one large flat one at the W., measuring 3ft. 7in. in height; breadth, 6ft.; thickness, 2ft. 3½in. The members after this set their faces homewards, some walking to Bath, others returning by the way they came, whilst others struck across the fields to Road Church, and followed the dreary main road to Trowbridge, in time for the 4.55 train to Bath.

Coming to the walks of the Club—on the morning of Feb. 26th, the members met at the Moore Museum, to hear the Rev. R. A. Cayley further explain his theory as to the original design of the Bath Abbey, propounded in his paper on "Church Doorways," read before the Club in December, 1888; and the following are brief notes of his remarks:—

"The points to be noticed are especially the turrets at the E. end, which, by displacing the Norman arches over the windows of the aisles from their proper position, show that they are contemporary erections. These turrets are in a customary position if they flank the chord of the apse, but not if at the angle between nave and transepts, *e.g.*, Gloucester, Peterborough, Durham. The base of the piers at the E. end of the exterior are of two dates, the inner and earlier being the respond carrying the arcade of the apse ; the outer and later being that of the arcade of the Transitional extension eastwards. There is a palpable bend southwards of the church E. of the transept, and in the earlier building this was more marked. This shows that the present choir corresponds with the old one. The transepts I believe to have taken the place of towers in the Norman church, as at Exeter Cathedral; and there could have been no central tower in its present position, or the foundations would not have settled when rebuilt. The old piers beneath the floor of the nave show the aisles to have been very narrow, and the nave probably about two feet wider. The old wall with its plinth visible under the S. doorway on the exterior, shows that the pre-existent lines were followed in the present structure. The cloister was connected with the church by two short passages. The vestry stands on the lines of the E. one, and measured about 110 feet in the square. The S. and the vestry doors communicated with the church. On the W. side stood the Palace of the Bishop (afterwards the Priory House) ; to the S. the Refectory, with cellars beneath. On the E. would be the Chapter House, and in the S.E. corner the Frater House and the Dormitory above ; the latter probably extending over the vestibule to the Chapter House, and possibly communicating direct by a staircase with the church, for convenience for the night offices. There was probably a smaller cloister with the Infirmary church (for the sick and aged monks) near the Friends' Meeting House ; but all trace of it has gone, the church having been probably destroyed and replaced by S. James' Church in the late 15th century."

Mr. Cayley then conducted the members to the Abbey itself, and entered more into detail, pointing out the various portions of the building which induced him to hold these views. Standing in the S. aisle, and looking towards the E. end, he called attention to a mass of masonry immediately N. of the E. window, which he considered to be the remains of a Norman turret. The position of this masonry (if Norman, as he supposed it to be) would account for the present Norman moulding over the E. window being cut off, as it were, by the S. wall of the aisle; as this was originally an arch of the Norman apse leading to an ambulatory at the E. end, and had in the 16th century been built against and partly concealed by the present S. wall. The base of the Norman piers in the N. aisle were then shown, and the remarkable narrowness of the present transepts explained by the conjecture that probably they were the site of a N. and S. Norman tower lengthened in the 16th century to their present shape. The present central tower was not on the site of a Norman tower. Going outside, he pointed out the plinth of 13th century work beneath the arch of the S. porch, and where the lines of the S. wall of the Norman Abbey ran, and the supposed site of the Cloisters on the S. At the E. end, he explained his views as to the Norman bases beneath the external butresses, *i.e.*, that instead of being the bases of the piers of a central tower they were the bases of the pillars of the arch forming the Apse and Ambulatory; and that they were of two dates, the angular one being evidently a portion of a large round base of earlier date than the others, which he considered Transition. After this the members walked to Tucking Mill, near Midford, to select a suitable position for the erection of a marble tablet to the memory of William Smith. A plain marble tablet with the following inscription—

Here lived
William Smith,
"Father of English Geology;"
Born, 23rd March, 1769;
Died, 28th August, 1839.

has since been let into the masonry of the cottage wall, by the kind permission of Mr. Garrett, the proprietor of the Fuller's Earth Works adjoining.* The Secretary visited the section of Inferior Oolite adjoining the Midford Station, and after lunch the members returned to Bath.

On March 12th a walk, postponed owing to the snow, was taken by the Via Julia to North Stoke Church, where the Rev. F. W. O'Melia met the members and pointed out the peculiarities of the chancel arch, the remains of the rood loft, the curious font, shaped like a parallelogram, which he thought was Saxon, and the so-called sun-dial on the E. jamb of the S. porch. Some of the radiating lines of the latter had evidently been re-touched or added to, but in spite of the opinion expressed that they were merely the irreverent scratches of some village rustic, their correspondence with many of those circles and semicirles with radiating lines of varying length found on the N. as well as the S. walls of our churches of a certain date, support the opinion that they are the work of an earlier period than that of the village artist. Having looked at some bases of Roman columns and the Roman coffin lately discovered, and now at Mr. Gibbs's farm, the members returned over Lansdown and enjoyed the fine view of the Welsh mountains with the "Sugar Loaf" standing out conspicuous in its mantle of snow.

At the Quarterly Meeting in October the Secretary presented the following report, as delegate from the Club to the Corresponding Societies' Committee of the B. A. :—

Your delegate attended the meeting of delegates of the Corresponding Societies held at Newcastle-on-Tyne, on September 12th, under the presidency of Sir F. Galton. After the report of the Committee of the Corresponding Societies to the General Committee of the British Association, for the year 1888, had been taken as read, the President invited the delegates to make any statement connected with the work of the Committees appointed last year, or any suggestions as to the harmonious working of the several societies. Amongst the various matters discussed the following seemed the most important :—(1) The advantage of making an archæological index and survey of the whole of England, and showing on the map not only the prehistoric, but the British and Roman remains therein. The Society of Antiquaries ask the assistance of the local societies to aid them in carrying out this object. (2) Advisability of making observations on the surface temperature of lakes, rivers and estuaries, or any exposed water. (3) The gradual disappearance of native plants, and the necessity of local societies taking the matter up and chronicling, so far as they could, the disappearance of such plants. (4) The appointment of a Committee to investigate the invertebrate fauna, and cryptogamic flora of the fresh water of the British Isles, and to induce microscopists to undertake systematic investigation of the physical and geological features of the various rivers and lakes they studied. (5) By no means the least important subject discussed was the progress made in photographing various geological features of the country. A Committee was formed for this purpose, with Professor Bonney as President, which, it is hoped, will soon issue some recommendations on different points, such as the means of readily showing the scale of height or length of the section ; the most convenient size of photograph (8½in. by 6½in. has been suggested), and some systematic way of collecting and recording them, so that geologists might know what had been taken. Your delegate had the pleasure of exhibiting at one of the soirées some photographs, taken by one of the members of the Club, of the memorial tablet recently erected by the Club to the memory of William Smith at Tucking Mill, near Midford ; also some sections of the Midford sands in which he worked.

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* Photographs of Tucking Mill and the tablet have since been taken by one of the members, Mr. Norman, through whom copies can be obtained.

The finances of the Club are in a satisfactory state, as the appended balance sheet will show, and the members are indebted to Mr. Graham for having undertaken the office of Treasurer during the absence of Colonel Chandler from England. Seven vacancies have occurred by death and resignations, and ten new members have been elected during the year, so that the numbers remain about the same. In conclusion, the attention of members is called to the great advantage that may arise to the study both of Archæology and Geology by the more frequent use of the camera. Many old houses and important historical bits, as well as geological sections, may be preserved from oblivion by its use. Whilst several additions have been made during the past year to the Club's album through the kindness of Dr. Mantell and Mr. Norman, there is still plenty of room for more, and there are several sections asking to be photographed before they are grown over and lost to view.

H. H. WINWOOD,
Hon. Sec.

NOTE.—Since the above was being prepared we regret to record the decease, on Easter Eve, at Tangier, of the Vice-President of the Club, the Rev. Preb. Scarth. As one of the original members and an ardent archæologist his loss will be much felt, and his place supplied with difficulty.

The Treasurer in account with "The Bath Natural History and Antiquarian Field Club," for the Year ending February 18th, 1890.

Dr.	£	s.	d.
Balance from last year's Account	1	0	9
91 Subscriptions at 10/-, including one due in 1888	45	10	0
8 Entrance Fees at 5/-	2	0	0
Cash received from Secretary (*Re* excursion to Caerwent	1	0	0
Cash received from Peach for Sale of "Proceedings"	0	2	0
	£49	12	9

Cr.	£	s.	d.
Payment to Literary and Scientific Institution, for use of Rooms	4	0	0
Gratuities— Librarian, 10/-; Sub-ditto, 7/6; Porter, 2/6	1	0	0
Clerk, for addressing cards	0	5	0
Donation to Broome Botanical Fund ...	1	1	0
Tablet to W. Smith	2	2	0
Gratuities at various Excursions	1	7	0
Lewis and Son, Printing	24	11	6
Postages	0	17	4
Balance carried forward	14	8	11
	£49	12	9

Deposit Note, Post Office Savings Bank, £40, with Interest to March 19th, 1889, £2 15s. 6d.—Total £42 15s. 6d.

Examined and found correct,
(Signed) R. L. TAYLOR.

February 18*th*, 1890.

LIST OF EXCURSIONS AND WALKS

Continued from 1879. *Vol. iv., p.* 298.

1880-81.

Wick Rocks, and home by Battle Fields	1880.	March 30
Charmy Down		April 6
Blaize Castle		,, 13
Leigh Court and Avonmouth		,, 27
Lydney Park		May 25
Corfe Castle and Wimborne Minster		June 22
Oxford (two days)		July 20 & 21
East Harptree and Lamb Cavern		,, 13
Radstock, Kilmersdon and Vobster		Sep. 28
Temple Cloud		Oct. 19

1881-82.

Siston and Pucklechurch	1880.	Nov. 1
Saxon Chapel, Bradford		Dec. 6
Roman Villa at Box	1881.	Jan. 3
Wraxall Manor House		Feb. 7
Wellow and Stoney Littleton		March 1
Bromham, Spye Park and Lacock Abbey		April 26
White Street Castle		May 24
Roman Villa at Brading		June 21
Portskewet and the Severn Tunnel		Oct. 11
Bathford and Box		,, 18
Kelston		Nov. 29
Bathampton		Dec. 20
Landslip at Combe Hay		,, 27

1882-83.

South Wraxall	1882.	Feb. 7
Great Charfield		March 7
Berkeley Castle		April 25
The "Manor of Forde"		May 9
Savernake and Marlborough		,, 14

1882-83.

The "Seven Springs" and Birdlip		May 23
Boscastle, Tintagel, &c.		June 6
Compton Martin and Cheddar Pass		„ 20
Manningford, Bruce and Devizes		July 18
Iron Acton		Aug. 29
Woodspring Priory		Oct. 10

1883-84.

Macsbury and Gurney Slade	1883.	April 24
Brent Knoll		May 2
Stonehenge		June 26
Blandford and Hod Hill (two days)		July 3 & 4
Westbury-on-Trym and Sea Mills		Oct. 13
Barrow Gournay	1884.	Jan. 15

1884-85.

Glastonbury	1884.	April 29
Avebury		May 2
Lacock Abbey		„ 6
Wardour Castle		June 24
White Horse, Bratton Camp and Edington		July 8
Cirencester and Fairford		Sep. 23
Charmy Down and Monkswood Water Works		Oct. 21
Frome, Orchardleigh Park and Cromlech		Nov. 11
Oakford Springs and Bath Water Works		„ 18
Murhill Quarry, near Limpley Stoke	1885.	Jan. 13

1885-86.

Twerton and Cloth Factory	1885.	March 3
Fullers' Earth Works, Combe Hay		„ 24
Corsham and Biddestone		„ 31
Newton St. Loe		April 7
Bristol and its Churches		„ 21
Devizes and Potterne		„ 28
Brockley Combe		May 19
Romsey and Rufus Stone		June 16
Tewkesbury		July 14
Stoney Littleton		Oct. 6
St. George's College, Downside		Dec. 29

1886-87.

Sherborne Abbey and Park	1886. May 4
Southerndown and Ewenny Priory (two days)	June 8, 9
Chepstow and Tintern Abbey	July 13
Ham Hill and Montacute	Sep. 14
Claverton Down and Hampton Camp	Oct. 26
Saxon Church at Bradford	Dec. 14

1887-88.

	1887.
Cromlech, near Cold Harbour Farm, and Granham Rocks	March 8
Bristol and its Antiquities	„ 22
Thornbury Castle and Church	April 26
Savernake Forest	May 25
Barry Island and Docks	June 14
Deerhurst	July 19
Roman Villa at Tockington	Oct. 11
Roman Coffin and Skeleton at Northstoke	1888. Jan. 2

1888-89.

Langridge Church	1888. Feb. 5
Caldicot Castle and Severn Tunnel	April 24
Christ Church, Hants, Poole Harbour and Bournemouth (two days)	May 15 & 16
Hereford and Kilpeck (two days)	June 19 & 20
Clevedon and Portbury	July 17

1889-90.

Bath Abbey and Tucking Mill	1889. Feb. 26
Via Julia to Northstoke Church	March 12
Sudbrook and Caerwent	April 9
Winchester Cathedral and St. Cross	May 7
Badminton	June 4
Cadbury Castle	Aug. 27
Beckington and the "Devil's Bed and Bolster"	Oct. 23

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PROCEEDINGS

OF THE

BATH NATURAL HISTORY

AND

ANTIQUARIAN FIELD CLUB.

VOL. VII., No. 2.

1891.

PRICE HALF-A-CROWN.

BATH:
PRINTED (FOR THE CLUB) AT THE HERALD OFFICE, NORTH GATE.
1891.

Some Memorials of Ralph Allen and William Pitt. By AUSTIN J. KING.

(Read 5th March, 1890.)

Nothing can be wholly devoid of interest, which relates to the renaissance of Bath in the 18th century, or to the great citizen and the great statesman, whose names are prefixed to these notes. I do not, therefore, apologise to the Club for the meagreness of my immediate subject; however much I may owe an apology for its insufficient treatment. There is also a certain personal interest, which attaches itself to the conjunction of men so different as the cautious, prudent Allen, and the meteoric Pitt.

And first as to Ralph Allen. He came to Bath, as will be remembered, in 1711, and was elected to fill a seat in the Town Council in 1725, but his active interest in civic life dates from his election as Mayor in 1742. From this date, down to his death in 1764, he ruled the destinies of Bath with an absolute personal authority, which in these days we find it difficult to realize.

William Pitt was a younger man than Allen. He was born in 1708, and in 1734, he was elected (if such a term can be used) member of Parliament for the Borough of Old Sarum; and for many years represented the three or four electors of that ancient constituency. In the year 1755, he was in the zenith of his oratorical fame. His withering denunciation of the coalition of Fox and the Duke of Newcastle, was rightly regarded as one of the most eloquent philippics which had ever been delivered in the House of Commons, and yet a few months afterwards, we find him the head of an Administration, which numbered Newcastle amongst its members. He became the darling of the nation. The Councils of the corporate towns, vied with each other in presenting parchment addresses, and for some weeks, we read, it literally rained gold boxes. Of his character, of his eloquence, of the times in which he lived, it would be out of place for me to speak, but one sentence which he addressed to the Duke of Devonshire, is so characteristic of the man, that I cannot refrain from quoting it: "My lord, I am sure that I can save this country, and that nobody else can."

The nation had indeed suffered not only defeat but insult; and the national spirit was then, (for the last time in our annals) beginning to sink. We may well imagine then, how this brilliant orator, this fervid patriot, was courted and sought after. How Allen became acquainted with him we do not know, but he was frequently in London in connection with Post Office business, and must have had numerous opportunities of mixing in political circles.

So much it has been necesssary to say, as to the two men with which this note is concerned.

The manner in which the House of Commons was constituted at this time, and for half a century afterwards, is too well known to need comment. In some places the right of election was vested in the citizens, in others in the small inner circle of citizens known as Freemen or Free Citizens, and in others again in the Town Council. In Bath the matter was more than once contested; but it was established that custom vested the power of election in the Town Council. The persons who were sent to Parliament therefore to represent the City, derived their mission from a body as far removed from the position of a representative, one as can well be imagined. The Freemen were but a fraction of the population of the City, and only Freemen could enter the Town Council. The Council was not even elected by the Freemen, but exercised the right of filling vacancies in its own number. But there was, practically speaking, an inner Council, consisting of the Mayor, the Justices, the Chamberlain and the Bailiffs, who formed a Committee sitting with closed doors. As a rule the members were nominated by this Committee. I can make the position more intelligible, perhaps, if I just mention two accounts, which have come down to us, of particular elections.

Warner, on the authority of Harrington's "Nugae Antiquae," gives us some amusing letters and memoranda relating to the election of John Harington. The date assigned (1646) is certainly inaccurate, but the documents appear to be authentic and to have been misread only as to date. The Mayor writes to Mr. Harington and "hopes he will accept the trouble" of representing the city in Parliament. The young gentleman (he was the son of the better known man of the same name) comes to Bath at Christmas time, and dines with the Mayor and citizens, and then enters in his diary, "Went to the George Inn at night, met the Bailiffs, and desired to be dismissed from serving—drank strong beer and metheglin—expended about three shillings—went home late, but could not get excused, as they entertained a good opinion of my father." Then the Mayor promised to give him a horse, and on the 31st December the newly elected dined again with the citizens, spent a good deal of money in wine and victuals, and tobacco and again "went home late at night."

This is an example of a peaceable election. If any one doubts that the citizens were well able to work up a "very pretty quarrel" over the exercise of the franchise, he has but to refer to the election of William Prynne and Popham in 1661, when Aldermen were kidnapped and Common Councillors run away with, and when the two parties vied with each other, as to which could make the most noise with big drum and trumpet.

But between these elections and the one in 1761, with which I am now concerned, much had happened. Bath had ceased to be a mere Hydropathic Establishment, and was rapidly advancing towards its present position of a health resort. The city was becoming very celebrated, and the cluster of men eminent as statesmen writers and divines, who gathered around Allen at Prior Park, extended its repute and importance.

Pitt was in Bath in 1754, at the time of the death of Pelham, and the Corporation then paid him great attention. Allen, in particular, had been affected by that glamour, which the great orator was so well able to cast over those who came within his circle.

In the year 1757 Pitt was member for Oakhampton, but was tempted by Allen to resign that seat, and accept the representation of Bath. The two sitting members were Sir John Ligonier, K.B., and Mr. Robert Henley. The latter was a lawyer, and held the office of City Recorder. It was proposed to make Henley Lord Keeper, and this would of course have necessitated his withdrawal from Parliament.

The first of the series of letters which I wish to bring before you is from the Mayor of Bath, Mr. Collibee, to Mr. Robert Potter, a friend of Mr. Pitt's:—

Sr,

Your obliging Favour, dated the 20th, came to hand yesterday morning at eight; in it you hint at a Conversation that pass'd between us in Regard to Mr. Pitts being a Candidate for this City. I remember at that time I set forth to you the connections that were between Mr. Langton and his Friends, and the improbability of their desisting from the intention of serving him till a generall Election.

I immediately on the receipt of your letter conven'd my friends on the Business express'd in it, which I apprehended was unknown to any other persons; but at the first outset of treaty with our Party, I found the Town was canvassing in favour of Mr. Pitt.

Mr. Langton was sent to, and as his Resolutions are to offer himself a Candidate, his friends are determined to serve him.

I should have given you an answer sooner, but as the affair was circumstanc'd possibly could not.

I and my friends really have the same due sense and regard for Mr. Pitt as we have hitherto possess'd, and should be glad of testyfying that regard when we have an opportunity of doing it.

I am yr. most hum. servt.

Edward Bushell Collibee.

P.S.

Some of our friends are absent, and when they return we shall have their sentiments, which will resolve us how far we can serve Mr. Pitt. But you require such a speedy answer, that I cannot possibley say more than what I have as above

Bath June 23 1757

Delivered in at the Office 40 minutes after twelve in the morng.

The next is from Mr. Potter. It is undated and runs as follows:—

Dear Sir,

Your second express being this moment come in, I think it necessary to answer it in the same manner, to prevent the anxiety you may be under from a longer delay. With difficulty I have prevailed on Mr. Pitt to accept the invitation sent by the Corporation, and without the Assistance of Ld. Temple, whom I carried to give weight to my advice perhaps I shd. have failed in it. But an answer in form cannot be sent till tomorrow night—because tho' I verily believe that every publick promotion will be fixed tomorrow, yet at present it is not certain that Mr. Henley will vacate his seat till after the Parlmt. is prorogued, in wh. case it wd. be highly inconvenient for Mr. Pitt to be out of Parmt. at the beginning of next Session. But this promotion being settled, and the Kg. being apprized of it, it is intended that Mr. Pitt shd. take some office expressly to vacate his seat, wch. will be the highest complimt. that he can pay the Corporation. But I find it is absolutely impracticable for him to think of getting down to the Election on acct. of the arrear of business in the Secretarys office, not a stroke having been done in it since he quitted in April. But I shall certainly attend his Election at Bath, and the moment it is ouer proceed to my own at Oakhampton. Mr. Pitt is highly thankfull for your invitation to P. Park wch. he hopes to accept before the Winter.

Sr. Robt. Henly has promised to resign the Recordership when we chuse he shd., and to keep it till then. He thinks it will be best to chuse a new Recorder while the Corporation is harmonious. He mentioned Mr. Pratt as a fit person, but, if you approve it, I have many reasons wch. induce me to take it myself having had an Education at the Bar, and being I trust qualified for it.

Yr. faithfull and affe,

THO. POTTER.

Sunday night near nine o'clock.

I propose returning from Oakhampton to drink the waters, and have taken the liberty to send to my wife to meet me at Prior Park, and to stay 'till you go to Weymouth.

The next letter is also from Mr. Potter. It is dated the 28th June, 1757, and runs thus :—

Dear Sir,

This is to go in an express Mr. Pitt sends to Bath, in order to inform you and likewise the Mayor, from whom in the name of Mr. Langton and his friends he has received a very polite Letter of Invitation, that matters are at last arranged in such a manner as will vacate Mr. Pitt's seat for Oakhampton and enable him to be chosen at Bath. He tells the Mayor that he is determined, if he can obtain his Majesties leave, and the publick business will permitt, to come down to Bath at the Election ; but as we know the publick business will not permitt, it is agreed that I should attend and represent him. We are all to kiss hands to-morrow, but no new Writs will issue till Tuesday July 5th, when the Parliamt. meets for that purpose, and in order to be prorogued.

As I must first attend Mr. Pitts Election at Bath and then go to my own at Oakhampton, it is necessary for me to precipitate the first and to procrastinate the last. The writ issuing the 5th of July, may be at Bath the 7th, and if Mr. Clutterbuck will get the Undersheriff to attend that day, he may make out immediately his precept to the Mayor, who may proclaim the Election the evening of the 7th, for Monday the 11th. And I can manage so as to defer that at Oakhampton to the 16th, wch. will give me time to vist. the Electors of Bath, and return Mr. Pitts thanks before I set out for Oakhampton. But tho' the Writ for the new Election may not be at Bath till the 7th, it is not necessary that I shd. stay from Prior Park so long. When I shall see it, I cannot now fix with certainty, but I know that till I do see it

I shall be impatient. Sr. Robt. Henly is Ld. Keeper, and now it seems Ld. Halifax did not actually resign, but only threatened to do it.

I am with the kindest affection and regard
Dr. Sr.
Yr. most faithfull
Tuesday June 28th THO. POTTER.

The Mayor shd. be told that Monday the 11th of July, is the Day on wch. Mr. Pitt desires his Election as being the most likely time for him to get leave of absence.

On the same date the "great Commoner" himself, writes thus to the Mayor of Bath :—

Tuesday June 28th 1757

Mr. Mayor,

Give me leave to present to you, and thro' you to the Gentlemen of the Corporation of the City of Bath, my most respectfull and warmest acknowledgements for the high mark of their favour and Confidence, in vouchsafeing to think of me for their Representative in Parliament. I have long ambition'd the honour of a seat there, derived from a Body so independent and so truely respectable as the City of Bath, and which can never fail to reflect Lustre and impart weight, to whoever they shall be pleased to think not unworthy of so high and honourable a Trust. As soon as the necessity of affairs will permit me, on my return again to business, to be absent from my attendance on his Majestys Commands, I propose to wait on the Corporation in person, and to assure them more particularly of the deep and warm sentiment of respect and gratitude, with which I am and shall ever be devoted to the City of Bath, and to every member of the Corporation. I am with the greatest consideration,

Mr. Mayor and Gentlemen of the Corporation,
Your most obliged and most
Obedient humble Servant,
W. PITT.

This letter was not sent direct to the Mayor, but under cover to Allen. The covering letter read as follows :—

Tuesday, June 28th, 1757.

Dear Sir,

The repeated instances of your kind friendship, and too favourable opinion of your faithfull Servant are such and so many, that thanks and acknowledgements are quite inadequate. Give me leave to present them to you, with a heart so truely yours as, on that account, makes me hope your goodness will accept them for something. I send open to you, for your perusal, two letters for Mr. Mayor, one private in answer to his receivd yesterday, the other for the Corporation : if you will be so good to seal them, and order them to be delivered to Mr. Mayor I shall be much obliged to you. You will please to observe, I have prepared the Corporation for my not being able to attend them in person at my Election, the thing will be utterly impossible, and I trust the necessity of affairs and my indispensable attendance on His Majesty will excuse me, I shall be better able towards autumn to wait on the Corporation, and hope no impression of want of due respect will remain, when the peculiarity of my situation, at the present moment is considered. I must in this, as in all the rest, rely on your goodness and friendship to help me out of my distress. I am with my whole Heart Dear Sir,

Your ever obliged and
Affectionate Servant,
W. Pitt.

My best respects
to Mrs. Allen and
Mrs. Warburton.

Almost immediately after Mr. Pitt writes again :

Whitehall June 30th 1757

Dear Sir,

The writ for Bath will be moved tomorrow, Sr. Robert Henley having receiv'd the great seal this day.

What I now beg leave to trouble you about, is that you wou'd be so good, to employ a person to be trusted, to prepare the Under Sheriff, and get the Precept ready, so that the election may be proclaim'd time enough to fix the Election for Saturday ye 9th of July. The writ will be in Somersetshire by the 3rd inst., and Tuesday is the latest day for the Proclamation, in order to go to Election on Saturday, as the day of Proclamation must be *exclusive* of the four days, the day of Election *inclusive.* I am more apprehensive that my attendance in Person on the Corporation will be utterly impossible, and I am very uneasy about it, lest I should appear to be wanting in that real regard I, with so much reason, feel for them ; may I again recommend this Distress to your friendly and kind offices, and hope you will add this to the many many obligations I feel to you, and shall ever most gratefully acknowledge. I am with all respect and affection

Dear Sir
Your most obliged and most faithfull
Friend and Servant
W. Pitt.

Mr. Allen replies to these letters as follows :

Dear Sir,

I have received the letter which you was pleased to honour me with the 30th of the last month, and in obedience to your Commands a proper person, who can be confided in, is imployed to prepare the Under Sheriff, and get the Precept, ready for your Election on Saturday the 9th of this month.

Your presence at the Town Hall upon that occasion would be very pleasing to all your Electors, if it had been consistent with His Majestys Service but, since it is not, I may safely venture to assure that no bad consequences will attend your absence.

When you receive an account from the Mayor, of your unanimous Election, you in your Letter of thanks to Him and the Corporation, will I presume be pleased to mention with concern, the cause of your necessary attendance in London on the National affairs, with your full intentions to make your personal acknowledgmts. for their distinguishing or rather peculiar regard to you, before the Meeting of the Parliamt.

Upon this pleasing occasion permit me to say that you shall certainly find me to be with the truest sincerity and most affectionate respect

Dear Sir
Yr most humle. and most obed. sert.
R. A.

Prior Park
July 2 1757
To the Rt. Honble. Mr. Pitt

The Election took place in Mr. Pitt's absence, and Mr. Allen wrote to him as follows:—

Dear Sir,

Permit me, upon my receipt of the obligeing Letter, which you honour'd me with by the Express, which you yesterday sent to the Mayor and Corporation of Bath, just to say that it is impossible for you to be more satisfied with the pleasing event which has been transacted in that City, than I am with the honest and faithfull discharge of my duty to my Country upon that occasion. And with the most Zealous and affectionate respect you will always find me to be

Dr. Sir
Your most humble and
most Obedt. Servt.
R. Allen.

Prior Park July 12th 1757
To the Rt. Honble. Mr. Pitt
My Family begs your acceptance
of their most respectful Compliments

This was Mr. Pitt's first introduction to the representation of Bath.

In 1761 there was a General Election, and, on the 27th March, "the Right Hon. Lord Ligonier and the Right Hon. William Pitt, Esq.," were unanimously elected. Mr. Ralph Allen was then one of the City Aldermen, but did not record his vote. Several addresses were presented to Mr. Pitt by the Corporation, congratulating him upon his services to the State, and the relations were of the most cordial character. In the year 1763, however, there was a very serious difference, and although the particulars are set out in Mr. Peach's "Historic Houses of Bath" (p 75) they are sufficiently germane to my subject, to tempt me to refer to them.

The war with Spain, which was declared in January 1762, was determined in the early part of the following year, by treaty of peace. This treaty was much canvassed, and Pitt, who had throughout strenuously advocated hostility against Spain, denounced the peace as inadequate and unworthy of a great nation.

Ralph Allen took a different view, and at a meeting of the Citizens in June 1763 he caused an Address to be framed for presentation to the King, of which the following is a copy :—

To the King's Most Excellent Majesty.

We, the Mayor, Aldermen, and Common Council of the ancient and loyal city of Bath, do beg leave to congratulate, and most humbly to thank your Majesty for an adequate and advantageous peace, which you have graciously procured for your people, after a long and very expensive, though necessary and glorious war, which your Majesty, upon your accession to the throne, found your kingdoms engaged in.

And we take the liberty to assure your Majesty, that upon all occasions we shall be ready to give the most evident proofs of the truest zeal and duty, which the most dutiful subjects can testify to the most gracious and best of princes.

In testimony whereof we have hereunto affixed our Common Seal, the 28th day of May 1763.

The citizens, very probably, passed the address without any particular idea that they were taking a strong line. At all events the resolution was unanimous. At this time the members for the City were Sir John Sebright, and Pitt. Ligonier had been raised from an Irish Title to an Earldom in the Peerage of Great Britain, and in April, 1763, Sebright was elected by 22 votes against 5 recorded for Walter Long. The address was sent to the two City members for presentation, and a courteous but somewhat acrimonious correspondence took place between Allen and Pitt. The latter absolutely refused to present the address, and concludes one of his letters with "Give me leave my dear good sir to desire to convey thro' you to Mr. Mayor and the gentlemen of the Corporation these, my free sentiments, and with the justest sense of their past goodness towards me, plainly to confess, that I perceive I am but ill qualified to form pretentions to the future favour of gentlemen, who are come to think so differently from me on matters of the highest importance to the national welfare." This was one of the last acts of Ralph Allen, who felt acutely his breach with Pitt.

The following letter from Sir John Sebright to Allen, dated the 10th March, 1764, is not without interest:—

Dear Sir,

By what I learn from Mrs. Warburton, you have been so kind to make frequent enquiries into the state of my health. I shall therefore take this opportunity of thanking you from my Heart for the very friendly concern you have express'd for my welfare, well knowing the sincerity with which you made those enquiries I am assured it will be pleasing to you to hear, my Disorder has entirely left me, and nothing bad remains, but the weakness and tenderness that must be the consequence of five weeks close confinement with the Gout. I am told I am to receive great Benefits from my pass'd sufferings ; however that may turn out, we must be contented and happy at least that my Pains have left me for the present. I set out yesterday where I left off 5 weeks ago ; and the first time I left my own house, was then to go down to the House of Commons to hear Mr. Grenvil open the Budget. He spoke for two hours and a half ; and his manner of laying open the State of the Revenues of this Country, and of his administration of them last year, was able, candid, frank and manly, and in my opinion did him great Honour. No opposition was made in the Committee to any part of what he laid before it ; on the Report perhaps, there may be some, but in my opinion the Minority will be extremely cautious of dividing the House again ; they had rather those names they have industriously publish'd, shou'd be supposed to be united, and on any other they are likely to agitate this year, there would appear a great deduction. The Supply asked from Parliament for this year is about £30,000. Taxes remain as they did pretty near He proposes that for the future America shou'd pay their own extraordinary expenses, or as much of them as may be which arise to above £300,000, almost 1 sh. in the pound on land: he has thrown out certain Modes of Taxation, which he thinks they may easily bear, and are to be chiefly to be laid more equally on molasses and such things as are now run from the French Island and from France and Holland directly to America, without touching in England: he thinks likewise a Stamp Office in America, wou'd produce something, and the Tax be easily and by few hands collected. I know not if this is at all intelligible. I am at all times a bad Financier, and yesterday was more fatigued by hearing, than Mr. Grenvil by the labour of speaking so long. Mr. Pitt was not at the house, he is still laid up, the house was full because great matters were expected, but nothing came of them.

With my best Compts. to Mrs. Allen and my constant good wishes for both your Health I remain

My dear Sir,
Your most obliged & most
faithfull Servt.
J. Sebright.

Bolton Street
March 10th 1764.

Allen died in June, 1764, and it is pleasant to remember, that on the 29th June, 1763, within a week or two of the correspondence to which I have referred, he made a Codicil to his Will in these words:

For the last instance of my friendly and grateful regard for the best of friends, as well as the most upright and ablest of ministers, that has adorned our Country I give to the Right Hon. William Pitt the sum of £1000 to be disposed of by him to any one of his children, that he may be pleased to appoint for it.

Nor is this quite all. On the very day of his death he said to his attendant, Thomas Hyett: "I die in good will towards Mr. Pitt, and there is a Codicil added to my Will relating to him."

Passing by for the moment the few words I shall have to say further as to Allen, I will continue the story of Pitt's connection with the city.

In May, 1766, the Town Council unanimously passed a resolution, "That the Right Hon. William Pitt, Esq. be respectfully requested to sit for his picture to be drawn at the expense of the Corporation, and to be affixed in the Guildhall, as a testimony of the particular respect and veneration for his great abilities, strict integrity, and constant attention to the liberties and interests of this free and independent Kingdom, during the glorious period of his Administration and since his resignation." Mr. Hoare was "to draw the picture."

On the 19th November, 1766, I find the following entry in the Council minutes:—

> Who shall be the Citizen to serve in Parliament in the place of the Right Hon. Willliam Pitt Esq now Earl of Chatham.

As my time is not, I think, quite exhausted, I will venture to place before you a few particulars as to portions of Mr. Ralph Allen's property. A statement prepared almost immediately after Allen's death shows his income to have been as under:—

From sundry tenants in Widcombe	£448	5	2
From the Claverton Estate	417	18	0
From tenants on Combe Down	96	2	0
From Bathampton Estate	659	2	0
From sundry tenants in Bath	723	12	0
From money in the funds and other investments	1776	19	0
Various lands and houses, not let, including house in Grosvenor Square, London, estimated at	951	0	0
	£5072	18	2

This estimate does not include the value of Prior Park mansion. It would be curious to estimate the income now brought in from the above mentioned estates.

Of the earlier title to the different estates, it is not convenient here to treat, although the history of the Bathampton estate, which formed a Royal manor in the reign of John, and was made the subject of numerous grants from that reign to the reign of James II., is replete with interest. In modern times the estate belonged to a Mr. Charles Holder, by whom it was much charged and encumbered, and a private Act of Parliament was passed in the year 1743, authorising its sale to Ralph Allen for £16,000. This estate was devised by Ralph Allen to his brother Phillip, in whose family it still remains.

The Claverton estate was in ancient times the property of the Bassett family, who in the Civil Wars stood out so staunchly for King Charles, and whose name was fairly worshipped by the citizens of Bath. The Bassetts have been accused of extravagance, and, whether from this cause, or from the more noble one that their means were impoverished by their loyalty, their fortunes decayed. The Claverton estate passed out of the family in 1701, and, after an intermediate purchase by Mr. William Skrine (a collateral relative of the present owner), became the property of Allen in 1758. Many years afterwards, in the year 1825, a claim was made to the Claverton estate, which although in itself fruitless and even puerile, well illustrates how quickly a family may sink in the social scale.

Sir William Bassett, the last Baronet, seems to have represented Bath from 1685 to 1690. He had no children, and after his death his widow sold to Mr. Skrine. It was said, however, that Sir William had a brother James, and that as the estate was a male fief under a grant of one of the Henries, there was no power to deal with it. In the investigation which followed, this theory was wholly upset, as it was demonstrated that the estates had only been entailed in the ordinary way, and that powers of selling and mortgaging (with the necessary formalities) not only existed, but had been repeatedly exercised. It appeared, however, that James Bassett, the brother of Sir William, had a son, Richard, a farmer at Winsley, that Richard's son, Joseph, was a smith at Widcombe, and that his son, Samuel, in 1825, kept the Old Fox at Holloway.

I have already trespassed too long upon your attention, and have left myself time for only a sentence by way of conclusion.

We may compare great things and smaller, national with municipal life. If Pitt so roused the dormant spirit of the nation as to make Englishmen glory in their country's freedom and power; if he taught them how to use their resources and make themselves invincible, so Allen gave a lesson to the Burgesses of the City of his adoption, which I trust may never be forgotten. He showed them that natural amenities must be supplemented by those of art; that, whilst architects might build a fine city and sanitarians might make a healthy city, true prosperity could only be obtained by attracting to it men of culture and learning, by cultivating the fine arts and building up upon the admirable basis which existed, a superstructure of social refinement.

Thoughts on Bath as a Roman City. *By* EMANUEL GREEN, F.S.A.

(Read 14*th January,* 1891.*)*

After endeavouring to gather and after reading what has been said or written about Bath as a Roman City, the impression left on the mind will be, that excepting the accounts of actual finds, nearly all is entirely speculative or conjectural. Further speculation however cannot be out of place as only by such efforts, accompanied by good reasoning, can we make any advance in our knowledge.

Proceeding then to think a few thoughts the first question which arises in order of time, is the origin of the pentagonal form of the city. It has been generally supposed, and perhaps taught, that Roman camps and cities were always rectangular. This is only partially true as there are many exceptional cases, caused generally by some peculiarity in the chosen site. The fine city known to us as Silchester is octagonal and is so because its walls were built on the lines of a British encampment. Pevensey is an irregular oval, the plan following the form of the ground.

Adhering to the first theory, in a paper printed in the "Proceedings of the Somerset Archæological Society," Vol. 31, 1884, it is argued that the outline of Bath was originally rectangular having the full dimensions of a large Roman camp. The boundaries it is asserted were, on the east the river; on the west the now Avon Street and the side of Queen's Square; on the north a line a few yards to the north of George Street; and on the south a line parallel with this last drawn at right angles to Stall Street at its junction with the Lower Borough-walls; the whole containing about eighty six acres. A plan is given which greatly aids towards understanding the argument. In this plan the North Gate has a central position in the northern line, somewhere near the top of Milsom Street but suggests no road attached to or passing through it. The pentagonal form it was argued was the outcome of circumstances, such as when peace reigned after the subjugation of the Britons, there being no necessity for a full sized camp, the plan was reduced practically to one fourth the original size by cutting off the northern part and building a wall at the offcut on the line now known as the Upper Borough-wall. But the part remaining must have still been rectangular and no way pentagonal. Also with this suggestion the North Gate must have been shifted from its assumed central position in the first wall, a necessity overlooked or left unaccounted for by the writer. Continuing his argument the same author, in the next year's Proceedings, Vol. 32, attempted to show that Bath was a military station occupied by the XX

Legion, but the evidences here were not more satisfactory than in the previous suggestions and could not be accepted. There is no evidence of any change of plan or that Bath was ever either a camp or a military station. A small guard it may be assumed would be there, and soldiers as well as strangers came there as invalids and died there, leaving in the form of altar or grave stone or otherwise, some token or record for us to discover.

When thus considering the origin of the outline of the city, the mind's eye must be cleared entirely of all present surroundings, of every building and street now familiar, and the spot pictured as a void neglected marsh, over or through which flowed the water from many cold springs as well as the water from the hot ones, forming a bog filled with reeds or rushes extending down to the river side. The Romans as new comers having first protected and enclosed the hot springs would proceed to lay out and wall in their new possession. Like an earlier people, they "walled in the town for their habitation and had the suburbs for their cattle and for their goods and for all their beasts." Taking the lower part of the site, many places along it must have been found too marshy and too wet to bear a heavy wall, thus the outline was determined here by the suitableness or firmness of the ground. Guidott* mentions that when digging some foundations in the south west and north west of the city, the workmen came to a soft yielding mud through which on being probed no bottom could be discovered. This was under some yards of gravel supposed to have been laid down by the Romans to make a firm surface. The northern line of wall, where the ground was dry and firm, is straight enough after the expected and usual manner.

Mr. Scarth in his book "Aquæ Solis," p. 108, treating of the Roman roads near Bath makes a statement which is certainly startling. He says, "after uniting at Batheaston with the road from Silchester, the Fosse road passed along Walcot and is then supposed to have passed up Guinea Lane to the head of Russell Street. At this point the two roads again diverged and the Fosse passed through the North Gate and left by the South Gate, crossing the river by a bridge." He does not say how the road got to the North Gate from Russell Street or where his North Gate was, but the full result is gathered in conjunction with what is said on an earlier page (p. 8) when treating of the Roman walls. Here he writes, "the great Fosse road ran through the city from north to south entering it at what is now the eastern angle of the Mineral Water Hospital, and passing down Union Street and through Stall Street quitted the city at the South Gate." The reading of these two paragraphs together means that the Fosse road came down Russell Street to Union Street, where must have been the North Gate, and so passed on through the city southward. A very novel and strange idea. In this statement may perhaps be detected the key to the suggestion already noticed, that Bath was originally a full sized camp, as by the plan given in that argument the same route must have been followed for entering the city on the north side. There never was a gate at the spot here indicated. The North Gate was not at the top of Union Street, and further Union Street is not a Roman street, nor on the site of one; it is not even medieval but quite modern. The Roman street hereabouts would be the present Union Passage, a street as Roman in appearance now as when the Romans left, except that the houses on either side are higher. But more than this Stall Street is not a Roman street but an early English one, laid down say when the Priory grounds were enclosed and forming as we know their outer boundary along the western side. The many finds in this street prove this assertion. Although already often published a passing notice of some of these must be given to clear the argument. In 1753 an inscribed stone was found when digging a cellar in the lower part of Stall Street; four feet lower coins were found. In the same place other stones having inscriptions were found at the same time. There was also a find in Stall Street at the west end of the Pump Room. In 1754 an altar to the Leucetian Mars was found in the upper part of Stall Street. About this date also an altar by one Sulinus was found at the lower end of Stall Street. In 1727 when digging a sewer in the centre of Stall Street, about sixteen feet below the surface was found the well known bronze or brass head called that of Apollo. When this was found there was such good evidence of the whole statue remaining in the same spot that a number of curious gentlemen entered into a subscription to indemnify for digging for it, but the Corporation absurdly refused lest the course of the water should be affected by the search.* There is thus possibly a good find awaiting and ready for some one. The Society of Antiquaries offered a tempting price for the head but could not get it.† There was yet another find in this year near the same spot, of which a careful account with a coloured drawing, here reproduced, is preserved for us in the British Museum. It is entitled a representation of the subterranean antient stoves as discovered in 1727 in Bath where the brass head was found near 16 feet below the surface of the street. It was drawn and measured upon the place "at Bath 20 Aug 1727 by Bernard Lens" and copied by Priscilla Combe. The original is now in the Bedleian. The top line represents the street or road surface, which was vaulted or underbuilt with wood for support whilst a sewer was being laid. The "east side" of this vault is shown "as it runs upwards the street." The top of the ladder is "the mouth of the hole dug over against Alderman Ford's house in Stall St. the 25 July 1727, to make a common sewer in the middle of the street and to convey the drains of the neighbouring houses by that means into the antient sewer" which is emptied in the river about ten yards westward of the bridge. This sewer is seen in the drawing descending in the lowest right hand corner. The depth of the hole was 15 ft. 10 inches. Just

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* "Discourse &c., 1676," p. 100.

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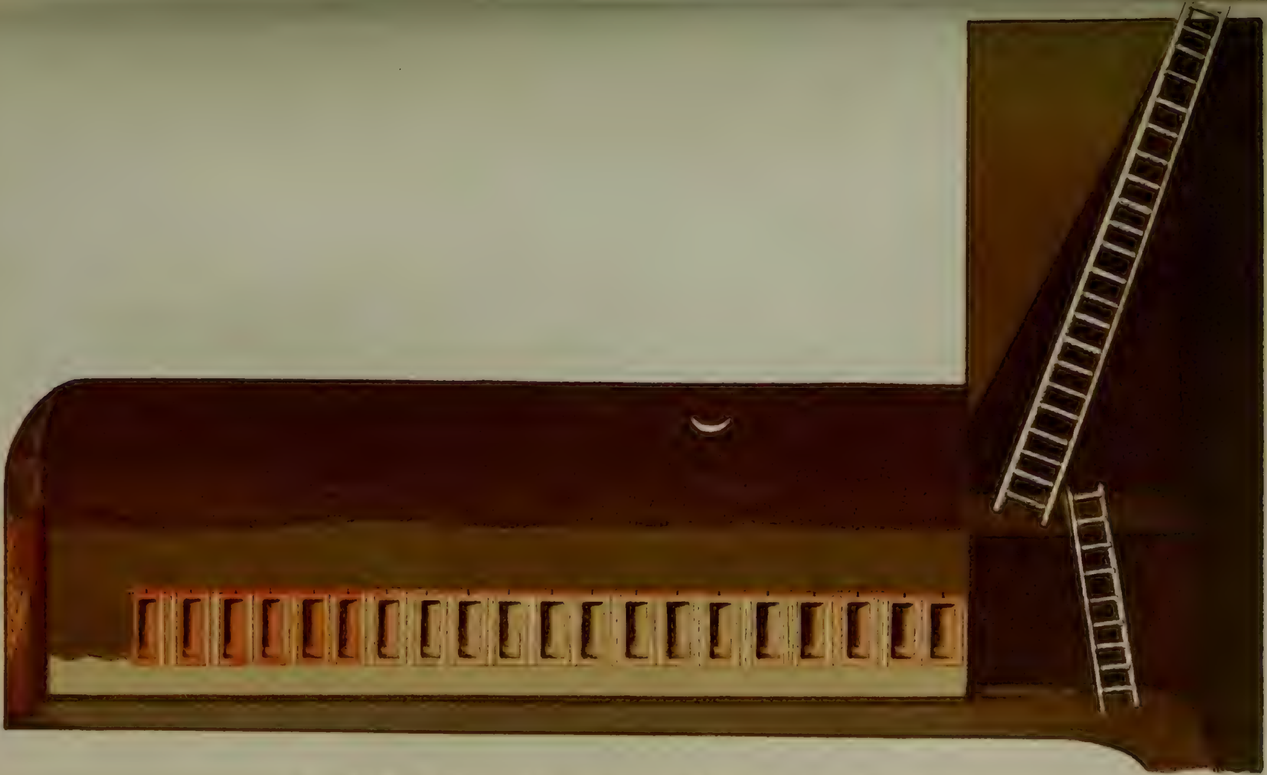
* Gough "Topography," p. 192.

† "Cruttwell's Guide, 1784."



ROMAN REMAINS, DISCOVERED AT BATH, 1727.

below the surface is seen a white crescent shaped mark; this was "a gutter of freestone of no use at present being underground, the foot seemed all composed of rubbish, coal, mortar, &c. to the gutter." On the extreme left, was "a solid brick wall that went athwart the hole" and following this was "a row of bricks twenty in number made in the nature of stoves all of one piece, hollow, a half inch thick within, sixteen inches high, five inches wide and six inches deep." Between each of them was put a strong and reddish cement of mortar and brick dust and a single tile; in the inside was found sticking "a black stuff very like soot; the stove "bricks were placed pretty regular one behind the other so that "you can thrust in a stick of three or four feet long towards each "side going towards the King's bath, was it not for the earth that "has got into them perhaps a great deal farther; they came about "a foot further the other side and that was their end or closing; "they had all pieces of tile clapped before each hollow. NB. "They stand on a clayish ground." Drawings are given of one of the hollow bricks taken out for the purpose; also of one of the tiles from the top, and one of the single tiles placed between. Again in 1790 when digging for the Pump Room, with many remains of columns and friezes, an altar dedicated to Minerva was found at the western end, these were supposed to belong to the Temple of Minerva, especially when remembering the well known record of Caius Julius Solinus otherwise known as Polyhistor, who writing about A.D. 250 mentions the Temple of Minerva at Bath. But it was soon detected that such a building must have encroached on Stall Street, a difficulty got over by the conjecture that it was erected after the street was made. Such a conjecture cannot be received as having the slightest foundation or approach to probability.

About twelve feet below the level a pavement of free stone was discovered having a channel at the extremity to carry off water and with steps fronting the east.* This pavement it was seen extended under Stall Street, but not enough of it was laid open to determine the form or size of the building to which it belonged. On it the foundations of the Pump Room were laid. Again in 1867 on the destruction of the far famed White Hart to make way for the present Grand Hotel, a bed of paved concrete was found which had been apparently surrounded by a court and smaller buildings. A fragment of cornice was precisely similar to another piece found in 1790 on the opposite side of the street under the Pump Room. The base of a wall uncovered was formed of very large stones some measuring more than five feet in length, probably part of an outer court. Drawings were made, it is said, of these things with the intention or hope of determining the plan of the building and for publication, but so far they have simply disappeared. It was at once concluded that these remains, as with all others previously found, belonged either to a Temple or the Forum, their front here facing the east, as those found opposite on the site of the Pump Room were the remains of a Temple which faced the west, Stall Street passing between them, as it does between the modern buildings there to day. The simple fact is that Stall Street not being a Roman street does not pass between, but is made or laid on, and really passes over the plan of an important building which covered the ground here in Roman times. It can readily be judged that this was the hall, the ante rooms, and the hypocaust, part of the frontage of the fine system of baths now partially exposed.

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* "Cruttwell's Guide," p. 17. "Archæologia," v. 10, p. 327. "Brown's Guide," p. 38.

But if Stall Street be not a Roman street and so not the original main central thoroughfare of the city as it is always assumed to have been, where was that street.

Northward of Bath the Fosse road coming by Batheaston reached Walcot. About the point where now stands Walcot Church a road now known as the Via Julia branched from it, passed up the hill about the site of Guinea Lane and by the head of Russell Street to Weston and then on across the Severn. The Fosse continuing its own line went on by our Walcot Street into

Bath through the North Gate which stood at the end of the present Northgate Street. Bath had the usual four gates at the compass points, so that opposite this point would be placed the South Gate. Besides these four there was in the medieval wall also a postern. This postern, known as the Ham Gate, led from the Priory to the Ham meadow. It stood a little eastward of our South Gate.

The supposition or accepted idea, other than the suggestion already quoted, has hitherto been that the Fosse after entering by the North Gate and traversing High Street, turned to the right along our Cheap Street and then to the left down our Stall Street and so out on the site of our South Gate. Such a road as the Fosse, a royal highway, ever going straight onward after the known Roman plan, could hardly have twisted about in such an unusual manner. This latter idea has been produced by the obliteration and obstruction caused by the Priory church and grounds, just as the former was the result of the usual conviction that the ever present cross roads found in Roman plans must have crossed in the centre of the city. This was by no means always the case. At Ilchester, on the same Fosse road, it was not so; at Silchester it was not so, as also at Gloucester and other places. By clearing the ground of all buildings, by giving up these fancies and continuing the Fosse from the North Gate through the City southward in the usual straight line, it is brought not to the medieval South Gate, but to near about the Ham Gate, which may be claimed to have been on part of the site of the larger Roman gate. The position now becomes clearer. When the Priory was enclosed, the Fosse road was cut and stopped by its northern boundary, and Stall Street being formed in its place the South Gate was moved westward to meet the new street; the site of the Roman gate becoming thus private property was utilised as a way to the Ham meadow. The line of the Fosse then, entered by the North Gate; passed along our High Street, through near the transept of the present church; on by the site of the Ham Gate and across the Ham meadow to, presumably, a bridge in line with it eastward of the present bridge, and so over the river to Holloway. The direction of Holloway from the hill side, as may be seen to-day, is towards such a bridge. To meet the abutment of the later bridges the direction of the road has been changed somewhat at the extreme bottom of the hill. The position can be clearly seen in the outline sketch map here given and in Stukeley's map printed in 1724. Thus the crossing of the highway always looked for in a Roman town, would have been at the junction of our High Street and Cheap Street.

One more suggestion must be made, viz., that the line of our Cheap Street, was continued in a straight line to an East Gate which stood near the house now known as Nassau House. Hereabouts long years afterwards, just on the boundary of the Priory grounds, were the Spring Garden stairs, and a ferry across the river. Such an outlet is all the Romans could have had on this side. The present East Gate would thus be medieval, and like the South Gate, its position was changed when the ground was enclosed; when the site of the ford was wanted by the Priory; when the Monk's mill and the weirs made with it were built.

Next an attempt may be made to glance at the interior arrangement or plan of the city, and here it must be remembered that the Fosse road must have been surveyed or made before the city was built; the city is built on the road, not the road through the city; the direction and position of the road influenced the plan and direction of the streets, which would be all parallel with it. However irregular the outline or walls may have been, the streets within were always symmetrical, running parallel with the high road as to one direction, and parallel with the main street which always crossed it, in the other. All the streets thus formed a rectangle at every junction. There was no deviation from this rule. First then must be taken the south eastern quarter of which most is known, where existed the fine system of baths, now in part visible. Hitherto nothing has been made of the plans of

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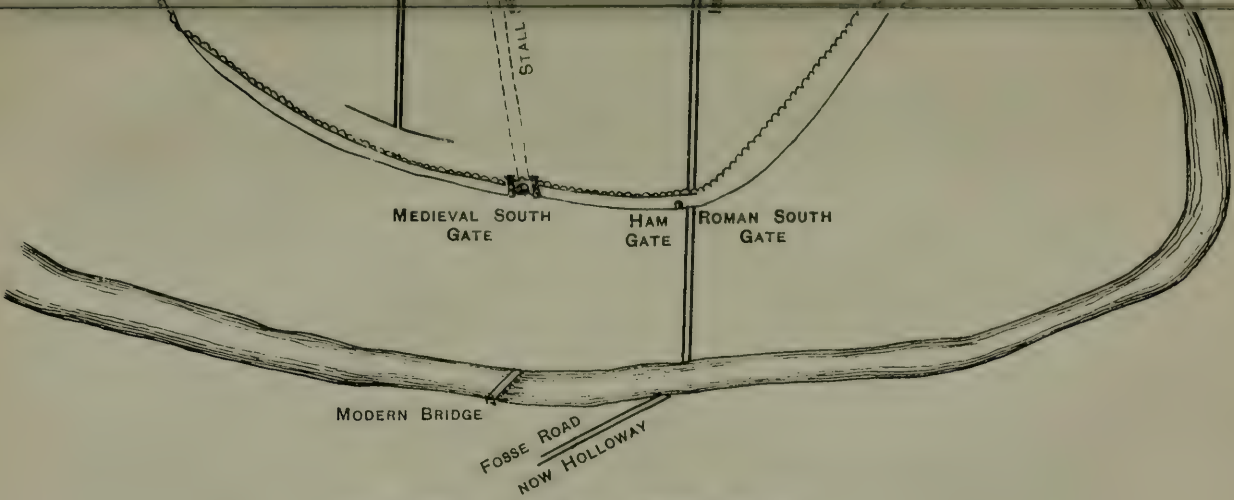
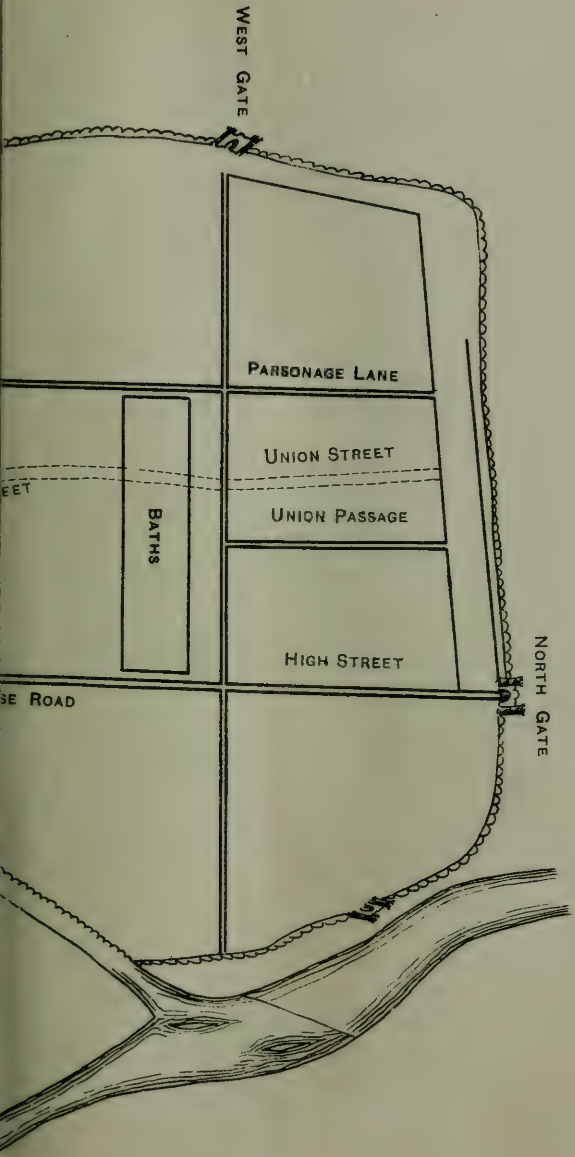


IDEAL SKETCH PLAN OF ROMAN BATH

B.N.H. & A.F.C. Proc. 1891.


WEST GATE
PARSONAGE LANE
UNION STREET
EET
UNION PASSAGE
BATHS
HIGH STREET
NORTH GATE
SE ROAD

these baths so often published. By the plans given in various books on the subject, such as by Dr. Spry, copied and reissued in Scarth's "Aquæ Solis," the front of the baths is supposed to be buried in the space between the end of the large rectangular bath and Stall Street; but the recent discovery that this space is occupied by a round bath makes the idea impossible. By abolishing Stall Street and so giving space in front, the whole plan can be completed. The Roman street which ran in front of the baths when so completed, is with but a slight exception discernable now. It is known as Parsonage Lane as far as Westgate Street which it crossed, passed through what is now the back yard of the Grand Hotel but which was once the stable yard of the White Hart Hotel, and then through exactly No. 11 Bath Street, across that street and on by St. Catherine's Hospital. The continuation on this, the south, side is under the colonnade of Bath Street and by substituting a colonnade for No. 11 on the north side, the whole street or way would be again open from north to south. By measuring depths and examining generally this position is clearly discerned. The side or foot pavement on the south side of Westgate Street at the entrance to the stable yard, shows or marks a former continuation of the now Parsonage Lane. It corresponds exactly with the side pavement of Parsonage Lane and must be there from some cause, as no such work would be put at the entrance to a stable yard but would rather be removed as an obstruction. Thus by simply clearing away No. 11 Bath Street there is formed a street duly parallel with the Fosse, giving the line of the western front or end of the baths and giving room for the outer court yard, for colonnade and steps, for entrance hall and side chambers, and all that is wanted. Moreover the flue tiles of the hypocaust which heated the buildings are still lying in situ under Stall Street. It may then be predicted that nothing will be found ih connection with the present exposed plans westward of this line, or eastward of the Fosse road as herein laid down.

At the eastern or opposite end, having the Fosse road for its boundary, is another bath on a smaller scale. This is known to be complete having hypocaust and all usual rooms fairly perfect. It was supplied from its own hot spring, which in later times was suppressed to avoid or prevent competition. Whether this was a public bath, say for women, or whether it was a private bath attached to some large house seems difficult to determine. The sexes often bathed together then, as near the same spot they did long years afterwards, so that the large bath may have been sufficient for general use. If the Governor's house could be placed hereabouts, nicely southward, in the sunshine, and on the high road, then it may rather be suggested that this bath was a private one attached to his house. The rooms seem too small for public use. Taking finally a view of the whole system we may imagine the ground open on the south having promenades and gardens and accomodation for various games.

In the north east quarter, in the angle now formed by the corners of High Street and Cheap Street, may have stood the Forum and the Basilica, always an important official centre, the Market Place and Guildhall of our day, and not far in fact from the present offices. It is found so placed at Silchester, the only example known. In this block too may be placed the principal shops and artificers, for it was along the high road by the North Gate, still known as the High Street, that all traffic passed.

From the finds in the north west corner a different plan may be judged. In 1738 a tesselated pavement was found when the Mineral Water Hospital was being built, also another in 1859, and an inscription on marble in 1861, thus marking the site of a house of some consequence, which probably occupied the frontage between our Union Passage and Parsonage Lane. In 1860 a tesselated pavement with other remains were found on the site of the Blue Coat School, showing another good house westward of the last and westward of our Parsonage Lane. Tesselated pavements it may be concluded would be found only in the principal or official houses. Of the remaining quarter the south west, little can be said. It is still almost virgin ground. Some remains have been found there around the present baths, as also an altar in 1774 near the Hot bath and another in 1776. Another altar was found in 1809 near the Cross bath, and in 1825 a stone was unearthed under the United Hospital. Hereabouts may be placed the general Infirmary, an institution usual in Roman cities, but beyond this as a suggestion there is little to guide. Around these springs, centres our own history of the Bath waters as public waters, and here now, still all around them, are placed the oldest, as well as the most modern Infirmaries. This quarter has been so much changed and altered that any Roman plan can hardly be traced. In 1789 an Act of Parliament enabled the Corporation to build five new streets, all of these being near the Cross bath and the General Hospital. One went from Barton Street, near the General Hospital, to Stall Street; the second was Bath Street; the third went from north of the Cross bath to Westgate Street; the fourth from the west side of Stall Street near Bell Tree Lane to the Borough Walls; the fifth from south of the Cross bath to the Borough Walls. Also the houses in Cheap Street were rebuilt and some houses at the corner of the bridge removed.*

There is one other point which must come to the thoughts when endeavouring to realise the old position, but regarding which no suggestion has been made, viz., how were strangers and invalids housed or lodged. The small rooms, often so great a puzzle in the plans of Roman houses were used for bedrooms, mere alcoves closed with a curtain when in use. The larger houses had rooms especially for strangers, wings adjoining the private apartments and having separate entrances. Seneca—Ep. 89—rallying the Romans on their restlessness, says, somewhat opportunely for the present occasion—There is no lake, river, or mountain where your villas do not erect their lofty tops. Where-ever veins of warm water abound new lodging houses *(nova diversoria)* will be immediately built to gratify your luxury. Whether the meaning here would be equivalent to any thing we know as a lodging house must be left an open question. Some accommodation there must have been as the place, with such magnificent baths, must be judged to have been much what it has been and may be still, a place of ease and idleness; a mixture of groans, music, and flippancy; a resting place for humanity, old, infirm and in ruins; a comfortable thoroughfare from this world to the next.

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* "Brown's Guide," 1802.

Where a ground plan has been so closely built over as here at Bath fresh discoveries are necessarily somewhat difficult to make. Caution too should be exercised before determining the use of any remains. Of Temple or Forum nothing is known, but now that so much is known of the extent of the baths, the architectural details found may have belonged to them rather than to a Temple, especially as Minerva who is so often indicated in the finds, was directly the patroness of such waters as these of Bath. Also, after so long a lapse of time many changes will have occurred, so that the line or frontage of any street or way as seen must not be too rigidly accepted as original. The line of Westgate Street and Cheap Street, in the process of widening, and encroaching southward, will be found, like Stall Street, to be over Roman remains. The Roman street will, probably, be found under the northern side. Other less important ways will have deviated to meet later requirements, whilst others, especially in the north eastern block will have entirely disappeared. Some portion too would be garden ground. But the chief points herein humbly suggested may be even now easily and inexpensively proved and without inconvenience to traffic, by the employment of a couple of men for a short spell with those useful and necessary exploring instruments, the ordinary pick and spade.

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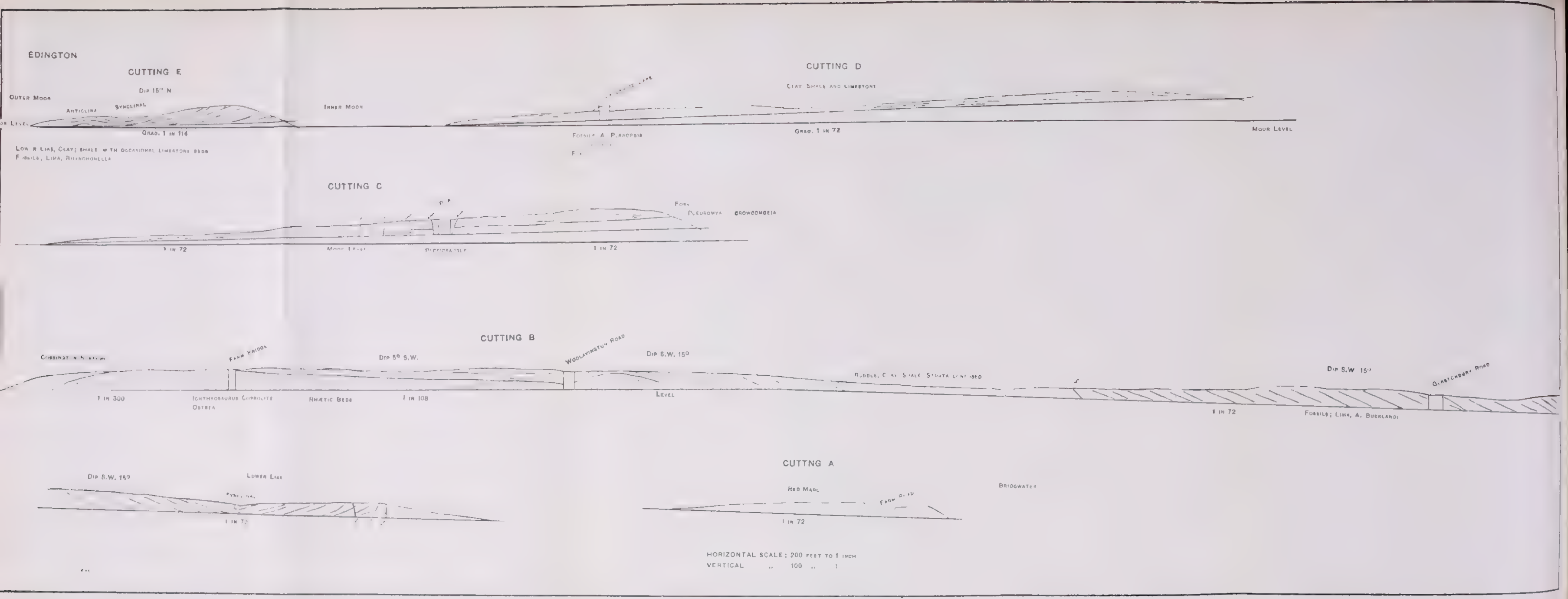
EDINGTON
CUTTING E
Dip 15° N
Outer Moor
Anticlina
Synclinal
Moor Level
Grad. 1 in 114
Lower Lias, Clay; shale with occasional Limestone beds
Fossils, Lima, Rhynchonella
Inner Moor
Fossils A. Planorbis
CUTTING D
Clay Shale and Limestone
Grad. 1 in 72
Moor Level
CUTTING C
Fos.
Pleuromya
Crowcombeia
1 in 72
Moor Level
1 in 72
CUTTING B
Cossington Station
Farm Bridge
Dip 5° S.W.
Woolavington Road
Dip S.W. 15°
1 in 300
Ichthyosaurus Coprolite
Ostrea
Rhætic Beds
1 in 108
Level
Rubble, Clay Shale Strata contorted
Dip S.W 15°
Glastonbury Road
1 in 72
Fossils; Lima, A. Bucklandi
CUTTNG A
Dip S.W. 15°
Lower Lias
Synclinal
1 in 72
Red Marl
Farm Road
Bridgwater
1 in 72
HORIZONTAL SCALE; 200 feet to 1 inch
VERTICAL ,, 100 ,, 1

The Geology of the Bridgwater Railway. A Brief Account of Lias Cuttings through the Polden Hills in Somersetshire. By J. F. MOSTYN CLARKE, Assoc. M.Inst. C.E.

(Read 28th January, 1891.)

The object of the present paper is to place upon record some account of the Geological formations exposed in the cuttings of the Bridgwater Railway, the construction of which opened up a continuous line of excavation through the heart of the Polden Hills. Belonging mainly to the Lias and Rhætic Beds, it was anticipated that the Geological sections would be of interest, a supposition which proved to be not altogether unfounded.

Having had charge of the construction of the railway until near the completion of the earthwork, the Writer has prepared the present paper in the belief that his description of the strata may be of value, when the slopes of the cuttings are overgrown. The railway extends from Edington to Bridgwater, passing to the north of the village of Cossington, where the summit is reached of that portion of the hills through which the Railway runs, and where there is the longest cutting, which practically extends for a mile.

Starting across King's Sedgemoor from Bridgwater terminus, the railway extends northwards, crosses the Great Western Railway, and from that point continues in an almost direct line to Bawdrip village, where it enters the first cutting. The portion of the Moor crossed between Bridgwater and Bawdrip lies nearer the Bristol Channel than the King's Sedgemoor of battle fame, otherwise some interesting antiquites might have been discovered. The Moor is level all the way, with only here and there local rises of a foot or so, and it has been within the range of history little better than a gigantic marsh. Its strata consist of a grey silty clay, varying very much from place to place. At Bridgwater, for instance, it is fairly stiff upon the surface, becoming moister and more treacherous lower down, until Black Quicksand is reached.

Dotted promiscuously about the moor are beds of Brick Earth sometimes of considerable extent. Half way to Bawdrip, where the line crosses the main road, one of these beds descends firm and hard to a considerable depth, while close beneath the hill in Bawdrip itself it becomes very soft, and is much charged with water.

On the bank of King's Sedgemoor Drain, the borings gave:—

	Ft.	In.
Brick Earth	21	6
Bluish Silt	13	0
Peat (decomposed) ...	6	0
Gritty Clay	2	0
Total	42	0

and lastly the Red Marl of the Trias. There is a belief in the locality that in places a vegetable bed underlies the clay. This seemed to be borne out by a boring sunk close to the crossing of the Great Western Railway, which disclosed a thin bed of brownish coloured sand, containing remains of a species of jointed reed; the specimens, unfortunately, fell to pieces. Among these remains a Saurian's tooth was also found. In cutting the side drains a thin layer of clay, a fraction of an inch in thickness, was met with some two feet below the surface of the ground. It was of a bright blue colour, entirely different from that above and below it, and extended over that portion of the line which is upon the moor, and may, perhaps, be a memorial of some great flood or inundation in bygone times.

We now pass to the most important portion of the Geology of the railway. The first cutting, lying almost directly north of Bawdrip Church, is of very slight extent, being only a few chains long, and 14ft. in the deepest place. It is entirely in the Red Marl, whose denuded surface probably rises in a gradual slope from the point where it was previously met with beneath the bank of King's Sedgemoor Drain. The Red Marl was also touched in the foundations of the road-bridge directly north of Bawdrip Church:

Upon the hill side, immediately above Cutting No. 1, a quarry was opened in order to obtain stone for building purposes, and the excavations here disclosed strata belonging to the Lower Lias, there being some 20ft. of limestone beds alternating with slaty clay and marl. The upper beds consist of thin layers of limestone and clay for about 5ft., the remaining 15ft. being thick beds of Argillaceous Limestone, interstratified with beds of Slaty Marl. The strata dip in a northerly direction at a slight angle, and belong to the group of beds worked for Blue Lias lime at Dunball. The fossils found in this quarry were numerous, *Pecten* and *Lima* being the most common, with also *Pleuromya Crowcombeia.* There was, however, an absence, as far as the Writer's knowledge goes, of Ammonites and Gryphææ, which make their appearance in the same hill a short distance further east.

Proceeding along the line, a short bank immediately succeeds the marl cutting, and runs parallel to the slope of the hill. Then we enter the principal cutting, which practically works its way through to the northern slopes of the Polden Hills. The entrance occurs directly north of King's Farm, and continues for some distance in rubble and clay.

The strata disclosed belong to the Lower Lias, dipping northward at an angle of about 15 degrees. They consist of limestones alternating with clays and shales, and are faulted in three places. After the third fault they present a synclinal fold, and the dip continues southward with an angle again of 15 degrees. The beds then follow on with great regularity until terminated by an oblique fault upon the north side of the Glastonbury Road. The main mass of these beds is formed of clays and shales, with bands of limestone every four or five feet. The lie of the strata is fairly horizontal in the earlier part of the cutting, but further on, past the Glastonbury Road, the dip is to the east. The thickness of the beds laid bare is considerable; Mr. Horace B. Woodward estimated this to be about 180ft. from the synclinal curve to where the fault abruptly ends the succession. Further on there are considerable signs of disturbance, the shales being highly tilted in places, but the beds are again repeated in the shape of shales and clays. The disturbance makes it difficult to estimate the whole depth of strata exposed, or the depth gained by upthrow at the last fault. That it is an upthrow there can be little doubt, when it is considered that further on we come to the Rhætic Beds at the base of the cutting.

Mr. Woodward's notes upon this cutting are the following:—"Northward of the third fault the beds present an undulating synclinal fold, and thence outcrop for some distance with regularity, dipping soutward at an angle of about 15 degrees."

"Clays and shales continue to form the main mass of the Lias, but they contain bands of limestone mostly hard and argillaceous, sometimes nodular, sometimes even-bedded about every three to five feet. A rough estimate of the beds here exposed gave a thickness of 180 feet."

Mr. Woodward considers that the strata represent in part the "Bucklandi Beds," but at about 115ft. *Ostrea liassica* is abundant, so that the lower beds, including those exposed in the quarry before mentioned, may be considered to belong to the "Planorbis Beds." Fossils throughout this section were very scarce. Southward of the Glastonbury Road impressions of large forms of *Ammonites Bucklandi* were met with in the shales and limestones. Occasionally a *Gryphæa* and several specimens of *Lima gigantea* and *Rhynchonella variabilis* were also found. The ammonites, unfortunately, were poor specimens. Northward of the Glastonbury Road no ammonites, and but few examples of lima, occurred.

Before reaching the Cossington Road on the south side, limestones again appear, much finer in quality than those hitherto met with, and still belonging to the Lower Lias. After running fairly horizontally for a short distance, they turn upward, being thus inclined to the south at angles of from 10 to 15 degrees. The layers of clay, shale and limestone continue to follow one another, until close to the site of the bridge under Woolavington Lane, when two beds, respectively 4ft. and 5ft. thick, of hard blue shale appear, separated by a bed of stone 14ins. thick. Underlying these strata are four or five beds of hard whitish limestone (White Lias), with beds of shale and stiff blue clay about 5ft. thick, and at the base Black Shales. These beds belong to the Rhætic formation, and they here form the nucleus of an anticlinal. Beyond the anticlinal the Lower Lias strata present a gentle synclinal structure, and the beds rise to the north at an angle of about 5 degrees. Farther on the Rhætic Beds again appear, and at the site of the farm bridge the Black Shales show a thickness of 12ft. Interstratified in these last are beds of fibrous carbonate of lime or "beef," one or two feet in thickness, and under these were some layers with nodules and crystals of iron-pyrites. In the lowest bed shown at the site of the farm-bridge some teeth and scales of fishes were found. Immediately above this there came a bed of bluish limestone, having nodules, hollow in the centre, and lined with crystals of carbonate of lime. In the Black Shales were also found besides the fish scales, many shells common to the Rhætic Beds, such as *Cardium Rhaeticum*, *Pecten Valoniensis*, and *Avicula contorta*. Further on by the Cossington Dingle this succession of beds somewhat abruptly ends, the latter part of the cutting being through clays and recent rubble.

Beyond the Dingle the line enters another cutting, and, after passing through the Rhætic shales and clays, the Lower Lias is again found overlying the White Lias with its top layer, the "Dew Bed." The strata here show signs of great disturbance, the limestones being very much dislocated, and in places the shales and beds of clays are tilted up and cut off within a chain's length. The chief fossil found in the basement beds of the Lower Lias was *Pleuromya Crowcombeia* in large numbers. A little further east the beds become regular, though frequently faulted. First we find shale and rubble overlying limestone shale in light laminated beds, all belonging to the Lower Lias. Below these are the Rhætic Beds, some four beds of pale limestone above a thick layer of grey clay, banded limestone, and lastly at the base of the cutting the dark blue or black shales of the Lower Rhætic Beds. These descend beneath the level of the railway, within a little distance of the bridge under the road; but further on they are faulted in such a manner that the basement beds of the Lower Lias, consisting of thick beds of argillaceous limestone and shales, are again upraised here and there, so as to display the White Lias at the base.

East of the bridge, where the beds are thus faulted, the shaly beds of the Lower Lias yielded the tail bones of a *Plesiosaurus* in admirable preservation and in complete order. The particular spot adjoined a fault that probably lowered the remaining bones of the skeleton out of reach of the railway excavation. The Saurian, to judge by his bones, must have been from 15ft. to 20ft. in length. Fossils in this cutting were rare, but iron-pyrites again appear, this time in cubes in the solid limestone, and also in veins and on the surface of the beds.

Passing eastward, and bearing in mind that the cutting is now along the slope, parallel to the range of the hills, we find the blue clays, limestones and shales of the Lower Lias exhibited. Several faults and disturbances occur, and in one place a band of limestone occupies a vertical position. Approaching the bridge over the lane where the railway again curves northward, the thick shale beds of the Lower Lias were again met. The strata abounded to a very remarkable extent in *Ammonites planorbis.* So plentiful were they that in one instance a large slab of shale taken from the cutting was covered so thickly as to make it almost impossible to put the point of a pencil upon it without touching an impression, and in some places they were lying many deep. The impressions themselves were scarcely indented in the shale, the original shell having been pressed perfectly flat. When first taken from the ground they had an iridescent appearance, afterwards drying white. Ranging for a depth of some 5ft. or 6ft. the shale could be divided anywhere in its laminations, and the impressions would be disclosed.

Upon the site of the bridge which is situated exactly where the line crosses the road on the map, in the thin bed of limestone close to the surface soil, there was found a fossil leaf of *Otozamites*, in admirable preservation. Some 10ft. beneath this, and in the shale, the vertebra of an *Ichthyosaurus* was met with, standing in high relief from the surface of its bed.

Passing further round the curve, another road is crossed. Beside this road, on the south, a quarry was opened, the stone being of a good quality. The strata beneath the foundations of the bridge dipped towards the moor, that is northwards, the slope being about 20 degrees. No fossils, to the writer's knowledge, were found in these beds, which belong to the Lower Lias, consisting of thin beds of dark blue limestone interspersed with clays and shale. This completes the main cuttings in the Polden Hills.

From the road which is crossed by the bridge just mentioned, the ground slopes gently down until the general level of the peat is reached, the line here being actually across a bay of the greater moor beyond, the division between the two consisting of a low ridge running in a direction parallel to the general line of the Polden Hills, round the end of which the two moors meet. They generally went by the names of Inner and Outer Moors.

Beneath a layer of light coloured peat, close to the last bridge, a bed of fresh water shells was exposed when cutting the drains.

A boring in the centre of the Inner Moor disclosed about—

	Ft.
Peat	15
Blue Clay and Silt	8
Peat	1
Stiff Blue Clay mixed with Ochreous Earth ...	2
Total	26

Beneath the latter, hard strata were met, probably belonging to the limestone and clay layers of the Lower Lias. The depth of the peat is apparently unequal, as two chains away from the situation of the boring just given, a bridge foundation was opened down to the top of the blue clay, through a depth of 7ft. of peat.

A few chains further on the Lias again crops out, about 23ft. in vertical height above the level of the peat, with a strike E and W. Dipping northward, at about 15 degrees, a slight synclinal fold follows, immediately succeeded by an anticlinal, in which the Lias finally disappears beneath the peat at an angle of about 15 degrees. There were only one or two beds of hard limestone exposed, the mass of the Lias consisting of the clays and shales.

The characteristic fossil of this cutting was the *Rhynchonella variabilis*, which occurred in the clays in very large numbers; one bed seemed to be inexhaustible, and the clay, when dried and broken in the hand, would scatter them literally by dozens. Some limas were also found, notably *Lima gigantea.*

The remainder of the line, from where the strata of the hillock dips beneath the peat, is on the Edington Peat Moor, and geologically calls for no special remark. In boring for foundations at a little distance north of the last cutting the Lias strata were again met with, still dipping northwards at about the same angle. Borings at the Edington Canal Bridge, within a short distance of Edington Junction, showed,

	Ft.
Peat	8
Blue Clay	24
Total	32

beneath which came hard limestone.

Nothing of interest was found in the peat, although many relics of bygone man have been obtained in the neighbourhood. It however abounded in wood, hazel and birch, which lay generally near the surface.

Before bringing the paper to a close, it may be as well to make a few brief remarks upon the general relation of the levels. Referring to the map, the summit line of the Polden Hills where the railway passes through them, may be taken almost due east from Dunball Railway Station, turning slightly south-east to meet the main road to Glastonbury, where our railway crosses it, and thence following the road for some miles. Cossington Park, as will be seen from the sections, lies almost level upon the summit, the permanent way of the Bridgwater Railway falling away on either side, the top of the hill here being broad, with a slight hollow in the middle. The Glastonbury Road runs along the summit of a very sharp ridge, the slope on the south side being in some cases almost precipitous.

With regard to the actual levels of the railway, we will begin with Edington Moor, which, being only 3ft. or 4ft. at the most above the level of the sea, we may take as our zero. The limestone, or what we infer to be such, below the banks of the Edington Canal, is about 34ft. down; passing southward it is next met with 10ft. below the surface, where it is rising in an angle of about 15 degrees to form the hillock between the Inner and Outer Moors. In this hill the strata terminate abruptly, giving a steep slope to the southern side, while beneath the peat it is again found at the site of an existing bridge (1 mile 62 chains) and 6ft. below moor level. Two chains further on it is touched again, 26ft. below moor level, and again on the extremity of the moor, where it is rising to form the Polden Hills. The Edington end of the long cutting commences 38ft. above the moor, the gradient of the railway rising as the line proceeds. The Rhætic Beds are found in the bottom of the cutting 84ft. above the level of the Peat Moor; the summit of the land on this side of Cossington Valley is 113ft. above the same level. Passing across the Dingle, the Rhætic Beds are found again in the base of the cutting, 95ft. above the level of the peat, the actual top of the Black Shale Beds being about 10ft. above the base of the cutting.

The summit of the hills on the centre line of the railway is touched about this point, and lies 123ft. above general peat level. The surface of the land gradually descends after leaving Cossington Park, and the line leaves the Lias cutting at a point 57ft. above peat level. The Red Marl is entered on the Bridgwater side, 43ft. above the same, and again touched for the last time 27ft. below it.

The general level of the Bridgwater Moor is 11ft. higher than that of the Edington Peat Moor.

In conclusion, the writer has to acknowledge much kindness and assistance from many quarters. Principally he is indebted to Mr. Horace B. Woodward, of the Museum, Jermyn Street, for constant advice and much geological information ; and to Messrs. G. Sharman and E. T. Newton for the indentification of the fossils ; to Messrs. George Wells Owen and R. Gervais Elwes, the chief engineers of the railway, for permitting the publication of the present paper, its subject matter having been obtained while the writer represented their firm ; to Mr. Robert C. Sikes, to whom the writer is indebted for the use of fossils found since leaving the neighbourhood, and for his kindness in obtaining much valuable detailed information ; and to Mr. S. C. Bailey for numerous drawings, notes, and assistance.

Summary of Proceedings for the year 1890-1.

MR. PRESIDENT AND GENTLEMEN,

The past year has been marked by the disappearance of several familiar faces from our midst. Death has taken away three members—six others have withdrawn owing to change of residence and other reasons ; with regard to the former, whilst the last number of our Proceedings was passing through the press the news reached Bath of the decease, at Tangier, on Easter Eve, of our respected Vice-president, the Rev. Preb. Scarth, the last but one of the original members of our club in 1855 remaining. Ordered to pass the winter in a warmer climate, he sought the northern shores of Africa, and whilst enjoying the benefit of change of scene, not unmindful of his favourite studies, was gradually mastering the antiquities of Tangier. Cheerful letters were received by his friends at home descriptive of the manners and customs of the natives, and of how little they had changed since the time of the Roman occupation. A sudden chill, however, seems to have carried him off in the midst of his loved pursuits, and we, as a club, have to mourn the loss of a man whose cheery presence, kindly manner, and enthusiasm in all Archæological investigations it will be found difficult to equal. In all the work of our Club he took an active share, as the various numbers of the "Proceedings," to which he contributed so large a portion of its papers, testify. His interest in its excursions seemed never to flag, and your Secretary daily misses the assistance of his mature counsel and advice in all matters connected with the Antiquarian branch of the Club's work. During the past year two other old members followed him—the Rev. C. De Courcy Meade and Col. Cockell—the former seemingly in the midst of good health and years, the latter more advanced in life. Though neither of these contributed any papers to our "Proceedings," yet they both did much, by their attendance, when able, at the afternoon meetings and the weekly walks and excursions, to forward the objects of the Club in their own particular way. They, too, have made a gap in our ranks to be remembered for some time.

Seven new Members have been elected during the past year, and it is a subject of congratulation that the Rev. Canon Ellacombe, who for so many years has been connected with us and contributed papers, botanical and otherwise, to our published "Proceedings," has been induced to accept the post of vice-president. The botanical side of the Club's work will thus receive additional strength, and may be expected to derive great advantage from his assistance.

The Anniversary Meeting was held on the 18th of February, 1890, as usual, when the Officers and Committee were reappointed, and the Excursions for the year fixed; and on Wednesday, March 5th, the fourth and last afternoon meeting for the session, 1890, was held at the Literary Institution. Mr. H. D. Skrine presided, and the first paper read was one by Mr. Austin J. King on "Some Memorials of Ralph Allen and William Pitt."

This communication, full of interesting local information respecting the great citizen and the great statesman of the 18th century, is printed in full at p. 99.

Mr. Skrine, in moving a vote of thanks to Mr. King for his paper, said that there was a good deal of doubt as to where Allen obtained the bulk of his wealth. He had considerable property in quarries, and he wished it to be believed that he made his money from them. It was generally supposed, however, that he made more from his mail contracts with the Government. His first contract was taken for £6,000 and this was afterwards renewed for £20,000 so that he must have secured a good profit from it, otherwise he would not have so largely increased his offer on the renewal.

Mr. Shum followed, and remarked that the best house in the Circus, No. 7, was built for William Pitt after his first election, when he had an idea of residing in Bath. Good houses were scarce in those days, and many were built specially for the great men who took up their residence here.

The Rev. H. H. Winwood drew attention to the remnant of Allen's town house which was still standing within a stone's throw of the Institution, and remarked that it was worth visiting by anyone who did not know it. He said the club was much indebted to Mr. King for the addition of some further interesting pages to local history.

Mr. King, in replying, stated that the letters which he produced were not procured from the source from which he had frequently gone before for facts in the compilation of his local papers, but that they were the property of the Allen family, and he was indebted to Colonel Allen for the use of them.

The second paper read was by Lieut.-Colonel BLATHWAYT, F.L.S., on "Mimicry amongst Insects," illustrated by drawings and also by numerous specimens of British insects and others from North and South America, India, Burmah, and the Gold Coast. After explaining that the terms "mimicry" and "protective resemblance" implied no voluntary action on the part of the insects, he divided the subject into three heads :—

1. Where it is adopted for purposes of concealment, either in order to escape the attacks of enemies or for purposes of attack, when lying in wait, to avoid being seen by its prey.
2. When it is adopted to render itself conspicuous, as a warning that the object is either dangerous or not good for food.
3. When neither dangerous nor inedible itself, it takes the appearance of another insect that is, and thereby obtains protection.

As examples of the first class, a number of insects British and foreign were shown, which obtained protection by their close resemblance to some inanimate object, such as a dead leaf, a lichen, or a bit of stick ; and among them several leaf-butterflies from Assam, Bhutan and the Andaman Islands ; and it was pointed out that the tip of the upper wings ends in a fine point as is the case with many tropical trees and shrubs, while the lower wings are drawn out into a sort of tail. From end to end there runs a dark curved line exactly resembling the midrib of a leaf, with other marks imitating lateral veins. The habit of these butterflies is to rest among dead or dry leaves, the wings closely pressed together, the end of the tail just touching the twig on which it sits, and forming a perfect stalk. The head and horns are drawn back so as to be quite hidden. Although in the same species the colours and markings of the wings are alike, the underside, or that which is exposed when at rest, varies very greatly, but all the variations are similar to those of dead leaves, and in some there are spots and stains exactly resembling those minute fungi that grow thereon.

To illustrate the case where the concealment is for purposes of attack by predaceous creatures, a walking-leaf insect was shown, of a species which has given rise to some curious notions ; for, in 1718, Bradley, a Fellow of the Royal Society, described and figured two kinds, of which he said that "the creature is hatched from eggs laid in the buds of the trees at the time the buds begin to shoot ; the insect is then nourished by the juices of the tree, and grows together with the leaves till all its body is perfected, and, at the fall of the leaf, drops from the tree with the leaves growing to its body like wings, and then walks about."

As examples of the second class, hairy, spiny, and bright-coloured caterpillars were given, and also those which take the appearance of reptiles ; and a drawing was shown of the larva of the *Pussmoth*, which, when alarmed, withdraws its head within the first segment of the body, giving it the appearance of having a large flat face, with two black spots which look exactly like eyes, and regarding which the lecturer said ; " Although to us there may not seem anything very terrible in the look of a caterpillar, we must remember that its comparatively insignificant size has to be taken into consideration, and that in the eyes of a small bird it may present a very different aspect. And were it not for this question of size, we might think with one who, writing of another order of insects, the beetles, says—

> Their shape would make them, had they bulk and size,
> More hideous foes than fancy can devise ;
> With helmet-heads and dragon-scales adorned,
> The mighty myriads now securely scorned,
> Would mock the majesty of man's high birth,
> Despise his bulwarks, and unpeople earth."

Among numerous other insects illustrative of the third class, Col. Blathwayt drew attention to a two-winged British fly, *volucella bombylans,* which consists of two varieties, extremely dissimilar in appearance, and he believed that this curious dimorphism enabled them to be parasitic in the nests of two of our commonest species of humble-bees, each variety closely mimicking a particular species of bee

The remainder of the paper was devoted to the butterflies of one species which mimic those of another species, with a discussion of the various theories that have been advanced to account for it, and the lecturer, in conclusion, said ; One of the objections brought against the Darwinian theory of variation was that the variation would be so small as to be practically worthless ; but Wallace has now shown, in a series of diagrams giving the exact measurements of numerous animals, that nearly every part of an animal varies very largely, usually ten or twenty, and sometimes even twenty-five per cent. of the average size of the varying part, and that variation, instead of being the exception, must now be taken as the rule. One must also remember, in the case of insects, how quickly they increase, and how short the life of an individual insect is, comparatively few living beyond a year ; and then the severe struggle for existence, only a very small percentage of those born living to propagate their kind ; and then the enormous period of time during which these modifications may have been going on. In the Lias of the Swiss Jura upwards of a hundred species of beetles have been found, as well as representatives of other orders ; and in some of the calcareous bands of the Lower Lias insects are so abundant that these are known as *insect beds.* The earliest known butterfly was found in the Lower Oolite. In a paper read before the Geological Society of London, Mr. T. M. Reade estimates that the series of post-glacial deposits on the coasts of Lancashire and Cheshire represent a lapse of time of not less than fifty-seven thousand five hundred years, and, according to Dr. Croll, two hundred and ten thousand years ago the Glacial period was at its maximum, and before this there were the ancient Glacial epochs, which, on astronomical considerations, he computes at three million years back. Many geologists, I believe, consider them all to have occurred during Tertiary ages ; but even allowing them to have been in the Cretaceous period, we have our ancestral butterfly immensely older still, dating back to the Stonesfield slate.

A vote of thanks to the reader was moved by Mr. SHUM, and a short discussion ensued in which the Rev. E. T. STUBBS and the SECRETARY took part.

The session of 1890-91 was opened by the VICE-PRESIDENT (Canon Ellacombe) on the afternoon of Wednesday, 17th December, with an instructive address on the vegetation of the past year. The substance of the address, which was given *vivâ voce,* was the following:—

After a few words by way of preface, explaining his reasons for the absence of a formal paper, he stated that the past year was an exceptional one. Often we hear this term applied without any substantial facts to support the statement; but he was going to bring forward a few facts to show that the past season was decidedly exceptional. With regard to the temperature, a mild November and December in 1889 were succeeded by a January in which there was a frost only on five days, on two of which the thermometer fell to 21°. February had ten days of frost, during which the lowest record was not below 26°. March four days of frost, on one of which, *i.e.*, 4th, 18° was reached. Notwithstanding the lowness of this temperature, *i.e.*, 14° of frost, but little damage was done, owing most probably to the dryness of the atmosphere and the extreme shortness of the minimum continuance, *i.e.*, about five minutes; for mischief arises in our country, as in France, more from the long duration of a frost than from its intensity. April had five days on which the frost was never more than 2° May, June, August, and September were entirely free. In October there was one day on which the mercury fell to 30° November seven days of frost, on one of which (the 29th) it fell to 21°. The result of this shows that there has been an exceedingly small number of days on which the thermometer fell below 32°. The present December has already had twelve days of severe frost, and it is feared that this may seriously affect vegetation. What then, may we gather from this? The result has been that things started into growth both early and very rapidly, and the shoots were ripened by a fine September and October. Coming to some of the plants themselves, the summer roses were poor, but the late autumn ones extremely good. The foliage of the plants was marvellously rich, especially, *e.g.*, the oak-leaved geraniums, and a great number of shrubs considered to be delicate made exceptional growth, establishing themselves very strongly. Fruit was, however, below the average, small and lacking in flavour. Plums were a general failure, except in Lord Sudeley's orchards, where they were abundant, and realized a good sum, the causes of the bad crops elsewhere not taking effect here for some cause or another. Apples, though small, were abundant in some places. Mulberries likewise very plentiful, but did not ripen well. Pears few, but good and keeping badly. Several plants flowered for the first time with him, *e.g.*, the *Edwardsia grandiflora*, a yellow flowering New Zealand plant. The single Bankshire rose for the first time in England. *Yucca rupicola* for the first time in England threw up a spike of flowers ten feet from the ground, exhibiting pods the fruit of which, however, never ripens in England, owing to the absence of a particular moth, through which these night-flowering plants are fertilized in their native habitat. *Gunneras*, from South America (*vide* Darwin's "Voyage of the Beagle"), with leaves measuring sixteen feet across in their native home, flourished this year, and the small *Gunnera Magellanica* flowered for the first time. These were amongst the plants exceptionally affected by the past season. The well ripened shoots of this year will probably most beneficially affect the growth of the next year, and many shrubs hitherto tender are likely to be sufficiently hardened to stand the hard frost now existing. As to the effect of frost on vegetation, more information was still to be acquired, and members of Field Clubs were asked to make especial observations (1) as to the different degrees and effects of frost at different elevations. Sometimes the low lands at the beginning of a frost register lower temperatures than higher lands, sometimes as the frost continues this is reversed. Observe then *(a)* the minimum, *(b)* the elevation, *(c)* the aspect. (2) Note how plants are affected by the frost, *i.e.*, what special parts of the plants' structure are most affected, and how. Note also the way in which they suffer, sometimes their top leaves are nipped and the whole plant dies; at others their roots are affected first and the process of destruction goes upwards; hence observations are required whether they are killed from above or from below.

After this interesting communication, which gave rise to a short discussion, the Secretary exhibited a recent addition to the Museum from the Rev. W. W. Martin, a former member of the Club. This was a mounted specimen of the now almost extinct New Zealand bird the Apteryx *(Mantelli* or *Australis)*, called from its peculiar cry the "Kiwi-kiwi." After a few words explanatory of its wingless character, its habits, food and habitat, the Secretary stated that it would henceforth be placed in the gallery together with the bones of the now extinct Dodo, illustrating the gradual disappearance of these struthious birds.

The Second Afternoon Meeting took place in the Lecture Room of the Institution on Wednesday, January 14th, when the following paper was read:—"Thoughts on Bath as a Roman City," by Emanuel Green, F.S.A. (*Vide* p. 114).

Canon Ellacombe presided, and at the close of this by no means the least interesting of the many valuable papers contributed by Mr. Green, remarked upon the pleasure it would have given to their late Vice-President, whose decease they all so much regretted, to have listened to this addition to the Roman history of Bath given, with so much modesty and yet so full of suggestive conjectures as to the history of that period. Bath was more barren of records of its Roman, British, Anglo-Saxon and mediæval occupation than any town he knew. What a difference there was between Bath and Bristol! Of the latter much had been written. "Bristow fair," though by no means boasting such antiquity as Bath, was constantly referred to by old writers, whereas "wondrous Bath" was singularly destitute of its chroniclers. Where are we to seek for the reason of this silence? Did it arise from its utter destruction in Romano-British and Saxon times? It was the spade and the pick that had recently done so much to elucidate the past. As to the marshy nature of the ground on the South of the city, alluded to by Mr. Green, he asked for further evidence, and concluded with the expression of a wish that Mr. Green would continue his researches into the history of our ancient city up to mediæval times and on to the 18th century, and hoped some of the members would puzzle Mr. Green with some questions.

Mr. Bartrum having alluded to the *finds* of Roman pavement behind Daniel Street, and the stone coffins, &c., elsewhere, Mr. Green, in reply, spoke of the great labour and difficulty in hunting up the earlier history of the City, and referred them to his first map published in the Proceedings (*Vide* vol. vi., p. 68); and as to the Vice-President's query about the marshy nature of the ground, mentioned the fact that the foundations of the walls appear to have been laid on marshy ground, and that the lie of the ground on the South was suitable for such a condition.

A Special Meeting was summoned for Wednesday, January 28th, to receive a paper from Mr. Mostyn Clarke on the Geology of the new line of railway between Bridgwater and Edington. In the absence of Mr. Clarke, through professional engagements, the paper was read by the Secretary. The object was to describe the first continuous excavation ever made through the heart of the Polden Hills, and was one of those papers so suitable to a local society, being a record of features likely soon to be obscured by time and vegetation. (*Vide* p. 127).

A short discussion followed, in which Messrs. Mantell, Knight, Daubeny, Bartrum, Rose and others took part. Questions were asked as to the gradient of the line and the depth of the cuttings, and also the time considered necessary for the formation of peat beds. The Secretary, having replied to the queries put to him, undertook to convey to Mr. Clarke the thanks of the members for his communication, for the admirable drawings of the fossils found during the excavations, and for the section illustrating the Geology of the Hills.

The fourth afternoon meeting was held at the Royal Literary Institution on Wednesday, Feb. 11th, when Col. A. F. Bingham Wright read a paper on "Personal Experiences of the Effects of the Recent Earthquakes in the Riviera," being the second part of a paper read on Feb. 6th, 1883, on "The Cause of Earthquakes," the Rev. Canon Ellacombe occupying the chair.

Col. WRIGHT, in the course of his paper, explained that he was wintering in the Riviera with his family when the great earthquake of 1887 occurred. They were at Mentone, and at early dawn on Ash Wednesday they were aroused from sleep by the bed shaking violently. The oscillations were tremendous, and were accompanied by a fearful noise, somewhat resembling the roar of a fast train running through a tunnel, though even this was drowned in other sounds of smashing glass, crockery ware, and the falling of roofs and walls. About 15 minutes after the first shock the grinding roar and fearful shaking came on again. The house seemed to rock like a ship at sea, but, contrary to expectations, the floor, below the top storey which was in ruins, did not collapse. Having recounted some stirring incidents of personal escapes and rescues amid the desolation, Colonel Wright observed that frequent tremblings succeeded the first two shocks, and as nearly as possible every three hours, a sharp shock. This continued throughout the day and next night with wonderful regularity. However, none of these disturbances proved so severe as the two initial ones that occasioned such wholesale devastation. Their direction appeared to be from N.E. to S W. The scenes that presented themselves during a tour of inspection suggested the results of a bombardment. Had this been so the inhabitants could hardly have looked more scared or disordered in appearance. In fact few of them had either time or opportunity of donning much in the way of costume, but there were exceptions to this; and a dash of the comic was introduced among the tragic scenes of the early morning by some of their Continental friends who managed to array themselves, pacing up and down as if on the boulevards, and raising their *topper* hats in true Parisian style. Col. Wright mentioned some curious facts in connection with the convulsion, the effects of which varied considerably in various places. Here and there were spots scarcely touched, and these lay between situations that had felt the visitation severely. That the source of the seismic action was very deep appeared evident from the enormous extent of the disturbance, and that notwithstanding its violence there were no openings at the surface. This was well established by the fact that the metals of the railway were not displaced at any point, and the trains ran without interruption. He had heard it stated by some who were there that on the preceding day the air had a sultry feeling, so commonly supposed to accompany an earthquake; but for his part he had found a contrary opinion relative to the atmospheric surroundings.

The Rev. Canon ELLACOMBE said every one, no doubt, had read particulars of great earthquakes, but it was extremely interesting to have Col. Wright's simple and graphic account of his personal experiences. He should like to know whether watches stopped at the time of the shock? He remarked that even the nerves of the bravest of men were upset, and they lost their heads at the time of an earthquake more than from anything else.

Major EVANS said that at Nice, at the time of this same disturbance, the electric clocks stopped at twelve o'clock, four hours before the first shock.

Dr. Mantell remarked that during an earthquake which he experienced in Bengal he was disturbed about six in the morning and found the water in the jug in his room swaying to and fro, and the natives noticed that about the same time the water in a pond was waving from one side to the other. All the clocks stopped at six o'clock.

Lieut.-Gen. Burn said there were seaquakes as well as earthquakes. He recollected an occasion when he was at St. Helena when the sea all round was agitated, but the island itself was perfectly undisturbed.

Col. Tabuteau related his experiences at Simla, when he was first made conscious of an earth-tremor by the movement of his bed up and down as if some animal was beneath.

Mr. Knight instanced that during an earthquake at Nice in 1884, all clocks stopped and bells rang. He did not consider that the condition of the barometer indicated anything, as it was not unusual near the Mediterranean for the glass to be low possibly during 40 days of continuous sunshine.

The Rev. H. H. Winwood asked whether the depth of the soil in the area of the severest shocks was known, as he believed the character of the strata had a great deal to do with the severity of the shocks—buildings on soft foundations such as clay or sand (which might be thought capable of acting as a cushion to modify the shock) generally suffering greater damage than others built on solid rock.

Mrs. Evans gave a personal narrative of an earthquake on the coast of Algiers, where, in the vicinity of Bleda, some French officers saw a village disappear in a cloud of dust, the result of an earthquake, though they themselves were unconscious of anything unusual beneath their feet.

Col. Wright in reply said that as far as he knew watches were not stopped, but the electric bells were set ringing. The shock, to a great extent, followed the lines of the ravines. He believed the soil around them was of great depth, and there the shock was felt the most. On the solid rock it was felt but slightly. He awoke earlier in the night, but from no apparent cause, and looked out. The night then was beautifully fine and clear. He retired to rest, and was again roused by the great shock. He afterwards found that other persons had the same experience, and therefore concluded that there must have been a slight shock when he was disturbed the first time.

This was followed by some elaborate historical notes put together by Mr. Rose on the character of William the Conqueror, and by the exhibition of a copy of the "Battle Abbey Roll." Mr. Rose's review of the conduct of the Conqueror and his nobles was by no means favourable. The Roll contained the shields of the "Principal Knights in Arms at ye Battle of Hastings, A.D. 1066."

The VICE-PRESIDENT considered that this Roll was destitute of any authority and was merely a list drawn up by the enthusiastic monks of Battle Abbey in the 14th or 15th century of those knights who ought to have been present; in the same way Dean Stanley had dealt with the worthies in his Memorials of Westminster Abbey; and Dean Plumptre in his life of Bishop Ken had given a list of those historical personages whom the Bishop might or ought to have known in connection with Wells.

EXCURSIONS.

Cardiff Caerphilly Castle, and Castell Coch, Tuesday April 22nd, 1890.—The first Excursion of the season was well attended, twenty members and five visitors answering to the Secretary's roll-call at the 9.3 a.m. train for Cardiff. The authorities of the G.W.R. had kindly placed a saloon carriage at their disposal, enabling them to detrain at Cardiff without any inconvenience, notwithstanding the excitement of the Cardiff races.

Having obtained the necessary permission through Mr. Corbett, the agent of the Bute Estate, to see Cardiff Castle, the members at once walked down St. Mary's Street and entered the precincts of the Castle through the gateway East of the tower, said to have been the place where Duke Robert of Normandy was confined for 28 years (1106-35). Turning to the left and following the covered way along the South wall, they entered the South-west Clock Tower, which has been most gorgeously fitted up for winter and summer smoking rooms in the Moorish style. A lavish expenditure in gilding, painting, and many coloured Italian marbles abounds throughout and is almost oppressive. A winding stone stairs leads up to the topmost storey, the summer smoking-room, whence a fine view of the surrounding country is seen. The chapel, dining-room, banquet hall, and library were next visited; in the latter an admirable arrangement consisting of a hinged flap in the place of the usual leather fringe for excluding dust from the top of the books was noticed. A descent down the grand staircase, made of polished Aberdeen granite, was made, and the quadrangle crossed to the keep, now a mere shell surmounting a mound of drift gravel, and the oldest portion of the original building now existing—date 15th century. Clark writes of this castle (Med. Mil. Arch., vol. 1, p. 336):—"Its claim to more than local interest rests upon the character and fortunes of the great barons whose inheritance and occasional residence it was from the 11th to 15th century, from the reign of Rufus to that of Henry VI." He considered it to have been originally a Roman castrum, and also a hold of the local British princes before Robert Fitzhamon won it in 1090.

After lunch at the Park Hotel, the members wandered off by way of the bridge over the Taff and through the green fields to Llandaff in time to meet Minor Canon Dowding at 3 p.m. at the West door of the Cathedral. Under his guidance a pleasant hour or two were spent in the interior, whilst he pointed out the various architectural details of the building. Originally founded in the 7th century by SS. Dubricius and Teilo the present structure dates from 1120, in the Episcopate of Urban. But little remains of this period; perhaps the chancel arch, with its curious rose-medallion mouldings, and a round arch in the South wall of the chancel may be of this date. The rest is Early English, *i.e.*, the middle of the West front, the nave, choir and chapter house, now the library, with its elegant column in the centre supporting a plain stone groined roof. The North-west tower at the West end is perpendicular, and the South-west, with its elegant spire has been entirely rebuilt after the style of the former Early English one. Great credit is due to Dean Conybeare, who, out of a mere ruin, restored a great portion of the building and re-opened it for choral service in 1857. A further re-edification of the Western portion was made under the superintendence of Mr. John Pritchard, architect, in 1869. The stall work of the choir is principally of teak inlaid with various woods, and there is a good picture by D. G. Rosetti over the altar representing David as a Shepherd and King on either side, with the Nativity in the centre. In the North aisle of the presbytery is a tomb with an effigy, said to be that of S. Dubricius, and another on the South that of S. Teilo. The old well inside at the West end of the South aisle, the water of which rose to the level of the floor, has recently been covered in. An ascent of the North-west tower was made and a fine view of the Welsh hills, Cardiff, the headland of Penarth, and the Taff Valley, obtained from the summit. Several grotesque faces at the termination of the hood mouldings of the nave arches attracted attention, especially one on the South side grinning through a yoke, with a corresponding one on the North, with the mouth covered by a cloth or some such garment, supposed to represent death.

On regaining the outside, Mr. Dowding conducted the members through the gateway of the old Castle into the grounds of the episcopal residence, permission having been previously obtained, and showed them a cross with the usual interlaced work, apparently Saxon, and found near a well in the grounds. Several pretty views of the Cathedral were seen from various points, and then the party separated, some returning by road to Cardiff, others by the fields—not, however, before cordial thanks were returned to Mr. Dowding for his guidance and courtesy. A visit to the extensive Bute Docks wound up the day. Here the great industry of the district was seen to its full extent, large steamers receiving truck loads of coal hoisted bodily up with their load of coal, silently, irresistibly and rapidly by hydraulic power and discharging their contents into the holds, the whole process occupying less than five minutes. The Park Hotel received those members who remained for the second days' excursion (14 in number), and the merits of the native wine, made from the grapes grown on the Castell Coch estate, to be visited next day, duly discussed.

Wednesday, April 23rd.—After an early start from the Rhymney Station, Caerphilly was reached about 9.20, and Mr. Robert Drane at once conducted the Members down the main street of the village to the S.E. corner of the Castle, whence a good view of the Water Gate was obtained. Here he gave the following general description of the structure ;—One of the most extensive castles in Wales, if not in England, it covers 30 acres of ground with its outworks. Chiefly noted for the immense strength of its fortifications, history is almost silent as to the events carried on within its walls. The architect or engineer who designed it is unknown to fame, but whoever he was he most thoroughly understood the art of defence, and so planned it that there may be said to be three castles, one within the other, so that if the outer defences were taken by the enemy, the second one had to be overcome before the middle position, perhaps the strongest of all, could be attacked. The period of its erection was probably in the time of Edward I. Built on an elevated deposit of gravel or drift brought down from the surrounding hills it could be entirely cut off from the mainland and isolated by damming up the waters of the Nant-y-Gledyr, flowing from the South-west to join the Rhymney, and thus forming a morass on the West, a lake or swamp on the North and South, approach being obtained only across the moat through drawbridges and portcullises most cunningly contrived. The whole may be divided into five parts; The Grand Front, the Horn Work, the Redoubt, the Middle Ward and the Inner Ward. Proceeding round to the Grand Front on the East and standing opposite the Great Gatehouse, Mr. Drane pointed out the strength and completeness of the line of defence on this side, probably the most perfect in the kingdom. First of all the broad and deep moat (now occupied by houses, pig-sties and gardens) formerly crossed by a double drawbridge worked on a revetted island in the centre. The long curtain wall, from 20 to 60 feet high, North and South of this gateway had some peculiarities in its structure. As the ground on the inner side rose to a considerable height, some 25ft., buttresses and towers had to be built against it, the lower portion of the wall battens considerably, and the upper space between the buttresses is concave, so that the enemy could not shelter themselves so well at the base, and missiles thrown from the top would glance off upon them more effectually. A low archway to the North of the gateway, about the level of the water, was probably a water gate. One feature was the absence of any *breteches.* There were no *puttocks* on the exterior of the wall for a wooden platform to rest on (as was usual, and might be seen on the South wall of the Inner Castle), so that the defenders probably had access to the wall along the top in some way from the Gatehouse tower. The buttresses are solid, quadrangular below and hexagonal above, and the towers of the gateway have pyramidal masses of masonry, the apex dying off into the main walls built up for strength and support at their corners. A Tête-du-pont terminates the South curtain, and defends it at this point from being outflanked. Going round to the North side Mr. Drane pointed out the sally port, whence cavalry could deploy on the *terre-plein,* and how difficult it was to approach the Castle from this side when the low ground was covered with water, and if this was passed the defences of the Outer Ward had to be overcome, then the moat, and finally the defences of the Middle and Inner Wards.

After a short time spent in finding the janitor and a toll of 3d. a head paid, a small door on the South in a modern wall admitted the members to the East moat between the Outer and Inner Ward. Standing opposite the tank, 50ft. long and 20ft. wide, supposed to have been used as a stew, the confused mass of tumbled walls and bastion came into full view. The destruction brought about by gunpowder rendered it difficult to trace the original design, and it required a long acquaintance with the Castle (such as Mr. Drane's) to unravel it. This, however, he was well able to do. Of course the question arose—not once or twice, but repeatedly—from various members who hardly followed his painstaking description, "When was this destruction brought about and by whom ?" The reply as repeatedly given, "I don't know—probably done in those troublous times to prevent the robbers and pillagers which frequented these districts from taking refuge within its enclosure and issuing forth again to harry the neighbourhood." The leaning tower at the South-east angle of the Inner Ward, forming one of the drum or bastion towers standing at the four angles and forming so conspicuous an object, was next visited. The inner half has been thrown into the court in fragments, the outer half remaining intact has merely been thrown out of the perpendicular some 9 feet ; one of the members standing with his heels close against the base and his back against the tower demonstrated this amount of displacement by the impossibility of maintaining his erect position without support. All four towers have been undermined and blown up. The effect, however, has depended upon the position in which the mine was placed ; one at the North-east corner has been entirely levelled, one at the North-west has been less completely destroyed. The evidence for their overthrow by gunpowder seems conclusive. Entering the Middle Ward at the South-east corner, the domestic offices were visited, the remains of the large oven for the garrison bakery being seen on the right hand, the pretty little *saxifraga dactilactyla* growing about the grass-covered ruins, the vaulted kitchen with its smoking chambers for bacon curing and curious angular smoky shafts—the domestic offices being overhead ; the laundry and inner room, where the lord took refuge in times of danger, and was enabled to communicate with his garrison through a square hole in the North wall opening into the dark passage between the walls above, called the Braose gallery, on any matter connected with the defence or internal arrangements of his household. Passing through these into the Inner Ward, the well in the centre, about 4ft. in diameter and 20ft. deep, Mr. Drane said had been cleared out and some rounded stones found at the bottom. One of the members (the Secretary) suggesting that owing to the Castle being built on drift gravel such stones might naturally be expected to occur there, Mr. Drane said there was evidence of their having been artificially rounded. The large Guest Hall on the left hand or South side, covered over by a modern wooden roof in 1871 by the Marquis of Bute, was next visited, measuring 73ft. by 35ft. and 30ft. high. It must originally have been a very fine structure, lighted on the North side by its four elegant windows, traces of ball flower moulding beneath ogee arches still remaining, indicative of its date. To the West were the female state apartments ; to the East the Chapel, now in ruins, with a cellar beneath ; on the South a door lead through an arched passage defended by a portcullis to the Watergate, the passage being sufficiently large to admit of the boats being drawn up there for protection when needed. Remains of filleted shafts resting on heads as corbels, formerly supporting the roof timbers, still adhered to the North and South walls—date 14th century. Returning to the Inner Court, the Western Gate house was passed through to the outer defence, or Horn Work, to which access was gained across the dividing moat by a double drawbridge. Two pretty little windows high up in the towers on each side still remained intact, owing to their inaccessibility to the hand of the pilferer. All the dressings of the walls, the mullions of the windows, the grooves for the portcullis, and other ornamental work was made of Sutton stone, the rest of the structure of Coal Measure Sandstone of the district. Wherever possible the Sutton stone has been abstracted either for purposes of burning into lime or as handy stones for other buildings. The Van, the residence of the Lewis family, three quarters of a mile distant, has the credit of being built with these spoils. A walk through the dark gallery and round the walls led to the Oratory in the North-east corner, whence a fine view of the valley and hills was seen. The three hours spent whilst Mr. Drane lovingly dwelt on the various details of the structure, with which he was so thoroughly familiar, were barely sufficient to enable one to thoroughly master all the contrivances and the reduplication of defence so skilfully planned by the lord of this castle, whoever he was. That he was well dreaded by the neighbourhood was evident, and the evil repute of the place still lingers in the local saying of anything lost or stolen that "it has gone to Caerphilly." The derivation of the name is doubtful. Caer Vili, some think. Who this Vili was is not known. Whether a British chieftain or not is doubtful.

A welcome bread and cheese luncheon at the village hostelry fortified the members for their four mile walk afterwards to Castell Coch. The party, now reduced by six members, who left Caerphilly by an early train for Bath, followed the road leading over the high ground to the South, and from the summit, some 500ft. above sea level, looked back upon the Castle and the coal basin bounded by the distant hills to the North and North-west; crossed the ridge, Cefn Carnan, of Coal Measure Sandstone and Millstonge Grit, separating the Glamorganshire coalfield from the lowlands on the South, passed over the Mountain Limestone, successfully wended their way through the mazes of the forest, and, after a pleasant walk, found themselves before the Eastern Gateway of Castell Coch, picturesquely perched on its limestone crag, overlooking the valley of the Taff. Armed with a permit from the agent of the Bute Estate, they crossed the modern drawbridge and found themselves in the courtyard of the recently restored Castle. Originally one of the Norman Castles built for the defence of the country from Chepstow to Pembroke, and called the Red Castle from the tint of its iron stained Coal Measure sandstone of which it was built, it stands on a platform of rock about 200yds. long by 70yds. broad. The West side precipitous, the North face defended by a deep moat, and the East cut off by a fosse cut deeply in the limestone rock, it must have been a fortress of great strength. It is triangular in shape, with a drum tower at each of the angles now fitted up as domestic offices. At the base of the North tower a steep flight of steps leads down to a dungeon, lit only by a narrow opening admitting a mere ray of light down a sloping channel in the thickness of the walls—a dismal place! This is perhaps the oldest part of the existing structure, and is probably Early English of the date of Henry III. The members were shown the upper rooms, and pretty peeps were obtained, through the deeply splayed windows, of the sandstone hill of Garth, rising 981ft. above sea level, on the opposite side of the Taff; of the river itself winding at the foot of the Castle crag, and of the well kept vineyards below on the slope of the limestone hill facing South, the produce of which the members tested the evening before. A rapid descent through the wood was made to a Mountain Limestone quarry at the foot of the hill now being worked. The whole face of the quarry was streaked and coloured red from the percolation of the water through the red soil on the surface, and a bed of riverdrift gravel resting somewhat up against its face was covered with a coating of *breccia* composed of angular limestone cemented together by carbonate of lime—a recent formation rather remarkable. Before taking the train for Cardiff at 4.42, Mr. Drane was cordially thanked in the name of those members who were present, as well as those who were absent, for his kindness in devoting so much time to their guidance and their

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appreciation of the instruction he had given them whilst wandering through the ruins of Caerphilly Castle. The return to Bath was made by the 6.30 p.m. train.

Boxwell Court, May 20th, 1890.—A morning of misty rain and South-east wind succeeding a most thoroughly rainy day, did not promise well for the 18 miles drive in prospect, and probably was the cause of the small muster opposite the Post Office at 9 a.m. Thirteen members only took their seats in the break out of the seventeen whose names had been sent in to the Secretary. So soon, however, as the high Cotteswold plateau was reached the weather improved and glimpses of blue sky every now and then were cheering. The foliage, too, of the trees in the Parks of Dyrham and Dodington looked their greenest and freshest after the rain. A short halt took place at the Cross Hands where the party was increased by Mr. Skrine and three visitors. After passing Petty France, instead of following the road to Didmarton, Badminton Park was left on the right hand and the main road taken to Boxwell Farm. Several tumuli were passed, connected no doubt more or less with the numerous camps which surmount the edge of the Cotteswolds, and indicative of many a hard fought fight on this border line in days gone by. A room at the Manor Farm was most courteously placed at the disposal of the members on their arrival, 11.15, by Mr. Clark, the tenant, and a fire was most acceptable after the somewhat breezy ride of the morning. Before starting for the morning's ramble, Mr. Skrine gave a short account of the family of the Huntleys, former possessors of the Court. From which it appeared that this family had descended from a stock that came over with William the Conqueror from Normandy, and derived their name from the Lordship of Huntley in Gloucestershire, near the Forest of Dean, given by the King, to Wythenoc Fitz Baderon, and by him granted to his nephew, William Fitz Baderon, Baron of Monmouth, and ancestor of the Huntleys. The third son of this Fitz Baderon was styled Sir Walter de Huntley and from him the present life tenant of the Boxwell Estate, the Revd. Osmond Currie Huntley, is lineally descended. The Huntley's were connected by marriage with the Throgmortons, of Tortworth, and the Ferrers, of Baddesley Clinton, Warwickshire. John Huntley, the grandson of George Huntley and Constance Ferrers espoused the cause of the Parliamentarians in the Civil War, was mortally wounded at the siege of Cirencester and was succeeded by his Uncle Mathew, who was an officer of Prince Rupert's Horse, and is said to have taken part in most of the great battles of the period, Roundeway Down in 1643, Cropredy Bridge in 1644, &c. &c. After the downfall of the monarchy he retired to Boxwell Court, but on the appearance of Charles II. he joined the royal army at the battle of Worcester, and on the defeat of the army again took refuge at Boswell with his son George and son-in-law, Sir John Wynyard. It was during one of the domiciliary visits to Boxwell Court in search of this determined cavalier (*i.e.* in 1650) that a melancholy event occurred which threw a dark shadow over the family, and gave rise to certain stories connected with the Court. The wife of Sir John Wynyard, who was at that time near her confinement, was so frightened at the approach of the armed searchers that she and her babe succumbed to a premature confinement. The following legend of the Cotteswold Hills describes this event:—

THE LADY CONSTANCE.

Oh! ask not who that Ladye fair
 Who silent glides the Hall around,
The chamber and the stair,
 And moves without a sound.

And ask not whose that gentle Child
 Wrapt in her silken fold,
Whom, mother still, with aspect mild
 She bosoms from the cold.

All nightly from ye storied Tomb,
  While the sun goes round by north,
On a saintly errand athwart the gloom
  From the Chancel she passes forth.

In haste to the Chamber away she has sped,
  In haste to ye Panel has gone,
She hath stood by the Bed and uplifted her head,
  And whispered "Thy will be done."

She passes to bless each loyal bed
  And holy dreams to inspire,
That the sleepers may pray when the morning's sped.
  For the end of their travel is nigher.

Then she waits dawn to count ye stars in the west
  And see the moon retire,
When she patient retires with the babe at her breast,
  For the end of their travel is nigher.

Soon after this another refugee comes to Boxwell, no less a personage than that of King Charles II. under the guise of a groom riding before the daughter of Col. Lane, on his road to Bristol, September 12th, 1651. The friendly shade of a wood called the "King's Walk," now the property of Mr. John Rolt, affording him concealment for a time. In memory of the King's visit the Inn at Leighterton is called the Royal Oak. The losses arising from the adherence of Mathew and his son to the Royalists caused the lapse of several manors. The grandson of this Mathew married into the Guise family, and his wife dying without issue he married, as his second wife the niece of the Right Rev. Dr. Chandler, Bishop, first of Lichfield and then of Durham. Several other intermarriages were alluded to, and Mr. Skrine, whose great grandfather was a Huntley, concluded with the narrative of a daring burglary which occurred at the Court about the middle of last century (Circiter, 1750), and was very illustrative of those times. During the occupation of the Court by some friends and relatives, one Crewe, who kept a notorious gang of outlaws in the neighbourhood, and one of whose strongholds was supposed to have been Robin Hood's Hill, near Gloucester, then (according to Mr. Webster Huntley's memoir from which Mr. Skrine quoted) covered with beech timber, obtained access to the Court one Christmastide when it was fully prepared and provisioned for the reception of numerous guests, and, having duly imprisoned the family inside their sleeping portion of the house, proceeded to pillage the plate and well-furnished larder, at their departure leaving a note of thanks for their entertainment and the abundant stores which they had enjoyed. A fall of snow concealing the traces of the robbers, Crewe succeeded in escaping, and was never called to account for this outrage—which he confessed when he arrived at the natural termination of his career—the Gallows.

The narrative read by Mr. Skrine was abstracted from a MS. memoir of the Family written by the Rev. Richard Webster Huntley, late Rector of Boxwell, and illustrated by drawings and illuminations by the hand of his wife—and the volume was shown to the members.

At the conclusion of Mr. Skrine's notes the members walked through the woods to the Court, turning aside to see the great Boxwood, covering about 20 acres of ground, and the largest but one of that species of tree in England. The spring which issues from this wood gives its name to the estate, and meanders through the valley by Ozleworth, and so through the hills to the great western vale. Those who went through the house (the consent of the present tenant, Lady Guise, having been first obtained) were shown the Elizabethan chimney-piece in the dining-room, portraits by Sir J. Reynolds and Kneller, the usual four-posters, said to have been reposed in by Royalty, and then visited the small Church attached to the Court at the South side. Here Mr. Skrine gave the following account of the Manor and Church. The Church of St. Peter de Gloucestre (so states Domesday Book) held the Manor in the reign of William the Conqueror. The

Abbey of Glo'ster held the Manor, temp., Edward III. A moiety of the lands in Boxwell—"Leighterton and Wast"—was afterwards granted to Sir Walter Raleigh, and on his attainder for high treason fell again to the crown and was granted to Peter Vaulore, a merchant, who was Lord of the Manor, 1608. The other moiety came to the Huntleys, temp., Queen Elizabeth. The advowson of the Rectory belonged to the Priory of Walsingham, in Norfolk, founded by "Sir Geffray Faverches Knyth" for the Black Canons. The little Church, consisting of a nave, chancel and South aisle, divided from the nave by three bays, is the mother church of the parish, and had regular services down to the latter years of the former Rector, Richard Webster Huntley, who then removed to the Rectory house of Leighterton. Many of the adjoining cottages having been pulled down, there was less reason for holding services. The Church necessarily falling into decay from damp and neglect, presented a pitiable aspect when seen two or three years ago, the rain coming through the roof, and the walls often being encrusted with green damp. Through Mr. Skrine's cousin, Mr. Osmond Huntley, and himself, and the assistance of the Rector, this state of things has been remedied and the little church been placed in good repair, the only thing wanting now being seats, reading desk and lectern, which it is hoped will be provided ere long by the assistance of the Diocesan Church Building Society. The font, situated in the North aisle attracted attention; it is octagonal in shape and rests upon eight rudely rounded short shafts and raised upon a square base. It was apparently an Early English font, since altered. The pointed arch leading into the chancel is of that date, as is the rather unique bell cot, which was successfully photographed by Mr. Powell (one of the members), and through the kindness of Mr. Skrine has been reproduced in Platinotype for this number. High up on the South wall were indications of a sun dial, the usual hole for the gnomon and two radiating lines cut in the masonry.

Ozleworth Church was the next point of interest, and the members wound round in front of the court and down the romantic combe under the guidance of Mr. Skrine who accompanied them a portion of the way. Following the little stream from Boxwood as it found its rippling way through the wooded valley, they crossed by a little bridge at the bottom, turned to the right, and, after a pleasant walk of about 1½ mile, found themselves in front of the comfortable looking mansion belonging to the Rolt family. The keys of the adjoining church having been obtained, the Secretary read some notes prepared by Mr. Skrine, from which it appeared that the Church, given to the Priory of Leonard Stanley by Roger Lord Berkeley, is an ancient building of singular construction, having an hexagonal tower rising up between the Nave and Chancel from Transition arches. A sharp pointed arch beneath the Tower exhibits highly relieved zig-zag ornament. The font is of peculiar construction somewhat resembling that at Boxwell, but whether a copy of an ancient font originally existing there or entirely new was not evident. The South porch, probably Transition, has its columns ornamented with foliage of an unusual type, but the whole structure has been so rebuilt or modernized that it is difficult to trace what is original and what is the freak of the so-called restorer. The Tower, however, seems to have been untouched, and is of Transition period and very interesting. Passing through the neatly kept churchyard into the garden the members were shown the latter by the gardener, and then taking a short cut through the grounds, descended through the wood, remarkable for its fine beech trees, recrossed the stream, and found their way back to the farm. After partaking of some refreshments which they had fortunately provided for themselves, and thanking Mr. Skrine for the trouble he had taken in arranging the day's programme and for the notes he had prepared, the party left for Bath at 5 p.m. At the Cross Hands a short halt was made for tea, which was very acceptable after their cold ride, and Bath was reached about 7.45 p.m.

Burrington Combe and Cheddar Cliffs, June 17th, 1890.—This excursion was especially geological. The authorities of the G.W.R. kindly placed a saloon carriage at the disposal of the members for Winscombe, on the Cheddar Valley line, where conveyances met them, in which, after some rather tight packing, they managed to stow themselves for a drive to Burrington Combe. It is a constant source of wonderment to the members how it is that conveyances that are warranted to seat sixteen, for instance, will only hold fourteen. The only conclusion they can come to is that the present generation have grown much larger in bulk since these conveyances were built, and for the future they always intend largely to discount the warranty—this by the way. After passing through the villages of Sandford and Churchill and thoroughly enjoying the rural beauty of the scene, the richness of the foliage, and the pretty cottages buried in roses, with their quaintly clipped yew and box trees, turning round the western spur of the hills they passed Mendip Lodge and following a lane on the right hand after Langford Green, halted at the West end of Burrington Church. Crossing a field which led to the churchyard they delayed for a short space to admire the beautiful turret staircase on the South side, and then entered the church. The Rev. W. B. De Moleyns, who was unfortunately from home, had kindly sent the register into the church, from which the Secretary was enabled to read an account of the restoration so admirably carried out in every detail. Notwithstanding the Vicar's absence refreshments had been most thoughtfully and kindly provided by his direction, after partaking of which the party walked into the Combe and began the chief work of the day. Attention was drawn to the various caves, Aveline's Hole, Goat Church Cavern, &c., which had been thoroughly explored by Professor Boyd Dawkins and Mr. Ayshford Sanford; search was made by some for the corals and fossils locally called "butterflys," which abound in the weather-worn *talus* of the Mountain Limestone; the "twin brooks" were followed up for the Transition beds, (the passage beds of the Limestone into the older Old Red formation), and finally the carriages were overtaken on the top. The change from the picturesque Combe to the bare table-land was most striking. Unfortunately the rain now fell and obscured the distant view across the Channel, and necessitated the giving up the contemplated visit to the Roman Amphitheatre and the Charter House Lead Mines. The members were content to see the refuse heaps of the old Romans and their abundant surface workings in the distance, and hurried on to the Cheddar Pass, down which they drove to the Cliff Hotel. It was generally admitted by those who had seen the rocks more than once before, that they lost nothing in grandeur by repeated visits, but on the other hand, rather gained in height and sublimity, and for inland rock scenery stand unsurpassed in England. After lunch the Secretary read a short paper on the formation of ravines and such like passes; and stated that there were three only possible theories, one of those which was held by Professor Boyd Dawkins and others he himself adopted, *i.e.*, that the Cheddar Pass was nothing more or less than a gigantic unroofed cavern, for which reasons were given. This, it need hardly be said, was received with the usual incredulity, expressed or silently felt. Gough's Cavern was then visited, and the return to Bath at 9.5 p.m. effected without any *contretemps*, after a very pleasant day amidst the scenic beauties and instructive geological features of our but too little known Mendip Hills.

Fairford and Cirencester, March 25th, 1890.—A wish having been expressed by some members of the Club to revisit the farfamed stained glass windows at Fairford and witness the process of reparation now going on in a most careful and conservative manner at the hands of Messrs. Lavars and Westlake, an excursion somewhat earlier in the season than usual was arranged and very successfully carried out. A break met the party on the arrival of the 9.50 a.m. train at Cirencester, and after about an hour's uninteresting drive, reached Fairford in good time. A walk round the outside of the Church and a cursory inspection of the masonry, for mason's marks, was first made—not without results—on the face of the West wall, in addition to the usual signs, one of those circles to which attention has lately been drawn was found; in this instance a simple circle with a central hole evidently not intended for a sun-dial. Before, however, the circuit of the Church had been completed, the Vicar, the Rev. F. H. Carbonell, appeared, and at once took the Members inside, first pointing out the dangerous process of decay which had been going on in the timbers of the roof (now being repaired), evidence of which was plainly visible in the rotten state of one of the main beams lying outside, the wonder being how it could have held together so long. Commencing with the window immediately to the West of the screen, on the North side, the Vicar first of all gave a short account of the history of the glass, and the usual story of how John Tame, the wealthy London merchant, in the beginning of the 16th century built the present Church for the purpose of containing the glass which he had captured at sea—a story which he and other archæologists discredited—giving as he proceeded in his description, many reasons, structural and otherwise, in support of the view that the glass was made for the Church and not the Church for the glass. But as to the designer and artificer of these 28 matchless windows authorities were not agreed; if Albert Durer had nothing to do with them (as was now the prevalent idea) who was the Englishman to whom they could be assigned? Without entering into the details of the interesting story which the Vicar, unfolded window by window, as he proceeded round the Church, finishing up with the great window at the West end (details which may be seen in "*Proc. Glost. Arch. Soc.*" *Vol. II.*, also in "*Proc. B.N.H.* and *A.F.C.*" *Vol. II.*)—it will be sufficient to mention that they contain a painted story of the Gospel narrative of the birth, sufferings, death and resurrection of Christ, succeeded by figures of the Apostles, Prophets, Saints and persecutors of the Early Church, and the final judgment; unequalled in design and execution by any Mediæval glass certainly in England if not elsewhere. The masterly grasp which Mr. Carbonell had of his subject, the reverend enthusiasm shown, and the patience of his reply to many interrupting questions, as, wand in hand, for nearly two hours he pointed out the minutest detail in the story, rendered the visit peculiarly instructive. It required someone who had spent hours and days in the study of these unique windows to point out the beautiful little accesories in the different lights. Here an open window in the background, opening out a view into a sunny garden, there the furniture and utensils of some sacred household. Then, again, cloistered aisle and tesselated pavement receding into the dim distance in admirable perspective, the crowns of Virgin and Saint, Angels and jewelled belts, all painted with the greatest accuracy—perfect pictures in *petto.* All these would have escaped the notice of an ordinary eye unless instructed by the master eye of one who had dwelt long and lovingly on the objects. Owing, moreover, to this intimate acquaintance with every detail, many pieces of stained glass which had been inserted upside down, or misplaced entirely, at the time when these windows, after the Cromwellian disturbances, had been brought out of their hiding place and replaced, have been restored to their rightful position; a piece of coloured glass, missing from some Saint's robe, recovered; the cross from the top of another Saint's staff fitted on again; a white glare of glass offending the eye, replaced by some bit of colour which had wandered off elsewhere. And thus the reparation and re-leading of these priceless windows has been carried on under the guidance and care of a man in whom antiquaries must have the fullest confidence. One other point is worthy of remark. A temporary floor has been erected over the nave for the much needed repairs of the roof, and thus an opportunity offered which may never occur again of inspecting the Clerestory Windows, their re-leading and colours, closely. This was taken advantage of, and the members ascended by a tortuous staircase on to the leads, and thence through a North window on to the flooring. All the wonderful details in the delineation of the twelve persecutors on the North side, and the twelve Martyrs, Virgins or Confessors on the South, can be studied admirably. The figures are most striking, the colouring of their garments and the various accessories beautiful, their faces most expressive, and the demons, with their red flames, truly hideous. It remained now but to thank Mr. Carbonell for his instructive guidance, to wish him every success in obtaining the last few hundred pounds which he requires to thoroughly finish his work of preservation of window and timbered roof, to lunch and drive back to Cirencester. Rain kept off until the Museum, where the records of ancient Corinium are stored up, received the members, where they spent the time that remained before leaving by the 4 p.m. train, in looking over the fine tesselated Roman Pavements, Samian ware and altars, puzzled over the inscriptions, and read probably the earliest squared words in existence, scratched on a Roman fragment of painted stucco. *(Vide Proc., Vol. 2, p. 133, 1869).*

Another pleasant day was spent on July 15th, when, at the invitation of their newly elected Vice-President, the members, to the number of 18, some by train, others on foot, visited the well known Botanical Garden at Bitton. After a cordial greeting on their arrival, Canon Ellacombe pointed out the various plants and shrubs not usually met with in an ordinary garden, *e.g.*, *Rubus Australis,* from the Auckland Isles, one of the most southern plants grown; *Cotoneaster horizontalis* from the Himalayas; the China palm, which had been out the whole winter, and the *Brugmansia* which was hardy; the creeping *Savin (Juniperus),* odoriferous after rain; the *Shumach,* which was cut down every year; the Californian bay; the Labrador tea plant; the *Paliurus aculeatus,* or Christ's thorn, so celebrated in legendary story; the Japanese hay—thorn and groundsel; holly *(ilex cornuta)*; North American vine; broom from Etna; *Paulonia imperialis,* cut down every year; many varieties of box; *Funkia;* South American thistle; *Rosa multifolia*, on which as many as 600 blooms had been counted on one stem by the Canon; *Rosa rubifolia* and *R. lucida*, both thornless, the latter a N. American species; *Carpenteria*; a hardy *Eucalyptus*; lilac, from the Himalayas; golden thistle, from Spain; *Colletia cruciata*, with its formidable spikes; *Wynter's* bark, used for quinine; the mandrake, and the fine specimen of *Salisburia* under whose fern shaped leaves the welcome cup of tea was enjoyed, and thanks returned to the host for the instructive lesson he had given to the members in Botany; and the proof he had shown that many plants, hitherto only grown in a greenhouse, may, by judicious planting and selection of sites, live and flourish in the open ground.

Great Chalfield and Bradford, Tuesday, July 22nd, 1890.—Quite a summer's day, in the midst of the late chilly weather and heavy rains, greeted the members as they entered the break, at 11 a.m., to the number of fifteen, for this excursion. The route taken was through Bathford and up the Box hill, turning to the right on the top and passing along the level plateau, and then down by the South end of the Monkton Farley avenue to South Wraxall, where the first halt took place opposite the Church. Here the peculiarities of the tower were pointed out by Mr. Browne, who considered it a very interesting specimen of 13th century work, quite French in character, with its three plain string courses, large quoins, North-west turret, staircase and peculiarly constructed stumpy spire, consisting of stone slabs dovetailed together and rising from the inside free of the battlements. An ascent up the spiral stone staircase was made to inspect the interior construction of this spire, and over the bells closely packed in the small space were seen the stone ribs, springing from the West and East sides of the tower walls, supporting the solid slabs above. The turret staircase had stone ribs also supporting its slab covered and elegant conical top. The interior is divided into a nave, chancel and North aisle, with a South transept chapel, called the Long Chapel, and containing a late 15th or early 16th century tomb, with a recumbent female figure, erected by Sir Thos. Longe, Knight, to the memory of his aunt daughter of Thos. Berkeley, by Elizabeth daughter of Thos. Seymer. The Marshall's lock or fetterlock round the North face of the tomb is the cognizance of the Long family. At the East of this chapel are two canopies, with a piscina in the South wall and a hagioscope into the chancel. At the foot and on the North face of the perpendicular pier supporting the arch of the transept is a short pedestal with a Norman or Transition capital apparently adapted as a stoup for holy water. Passing out through the south door, and by the late doorway into the Long Chapel, over which was cut in stone the letters, "R. An. Dñi, 1566 L." (the fetterlock and stag's head on either side), and through the neatly kept churchyard, the members followed a lane to the North-east for a short distance, and crossed a field to the fine manor house, now in the hands of architects, builders, and "restorers!" Admittance was most unfortunately denied us, but the tenant, Mr. Wright, most courteously showed us round the outside, and brought out "Walker's History and Antiquities of the Manor House of S. Wraxall"—a rare book, and one which he evidently appreciates and prizes. From his conversation it was gathered that during the recent pullings down evidence was found which indicated a date to some portion of this house earlier than that of the 15th century; 1480 being the usual date assigned to this beautiful specimen of domestic architecture. Obliged to be content with walking round the outside thereof, surveying its fine mullioned windows, and above all, its elegant octagonal chimneys (why should not chimneys be made an ornament to modern houses instead of a hideous disfigurement? there are many such models as these for builders to copy), the members thanked Mr. Wright for his courtesy, returned to the break, and, through shady lanes and devious ways, found themselves in front of Holt manor house instead of Great Chalfield. The mistake being rectified, the object of their search was at length found, and

Mrs. Bailey, the wife of the tenant, received them and conducted them over the house, a perfect specimen of a manor house of the 14th century; forming, with the buildings used for stabling, two sides of a quadrangle, the Church and the moat in front forming the third and fourth sides. The manor house seems to have succeeded to some fortified post previously existing, indeed, some suppose that it was once an outpost of the Romans, guarding their communications with the main road between Bath and Verlucio. The principal front faces North, and can hardly be excelled in the beauty of its outline, in the richness of the Oriel windows, especially the semicircular one which lighted the guest chamber at the East end, the elegant chimney shafts, and quaint figures on the gables of the banqueting hall, now turned into domestic apartments, temp., Henry VI. Passing round to the South of the guest chamber, the inner side of the Oriel was well seen, with its two elegant pendants, almost perfect, and stone groining. Beneath, in recesses, are preserved three of the masks through which the Lords of the Manor reconnoitered their guests in the hall from their upstair rooms without being seen. It now only remained to visit the Church, through the West door with its peculiar pannelled corbel. The interior is divided into nave, chancel, side chapel on South, with a modern addition to the East end of the latter. The walls of the body of the Church are considered to be portions of the original chapel, 1308; the West window, porch and bell turret more modern, temp. Henry VII. In the roof of the Chantry Chapel, the Tropenell arms, viz., "Gules, a fesse engrailed and powdered with ermine, between three griffin's heads, erased argent," indicates that this was an after addition by the builder of the manor house adjoining. A tablet over the small door in the South wall of the building East of the Chantry, with the inscription "R. N., A.D. 1775," shows that this was added by Robert Neale, *(vide Pugin's examples of Gothic Architecture).* On the South wall of this chapel is a monument to the memory of Richard Warner, the historian, with the following inscription:

Sacred
to the Memory
of the Rev. Richard Warner,
the late venerable, pious,
and benevolent Rector of this Parish,
in faith and practice a true Christian,
having attained the age of 93 years,
9 months, and 9 days,
he expired
on the 27th July, 1857,
dearly beloved
and deeply lamented.
41st Ps., 1st verse; St. Math. 25, part of 40th verse.

In the floor of Chantry Chapel is a slab to the memory of Margaret Horton, late wife of Edward Horton, "Greate Chal*d*field," date 1670, showing that at this time the "d" was inserted in the name of the place.

The amateur photographers having taken some views of the Manor House and Church, the members rejoined the break and trundled through the fields to the main road for Bradford, where they arrived about 3 p.m.; lunched at the Swan Hotel—about which the least said the better—and then visited the Ecclesiola and the Parish Church adjoining. Since the former visit of the Club to the Saxon Church, a low wall, surmounted by an ornamental railing, has been erected round the South side; this did not meet with approval, the general idea prevailing that something more in character with the simplicity of the architecture would have been better. A visit was afterwards paid to the fine Parish Church, and its architectural details pointed out by Mr. Browne, and then the steep ascent breasted to the little hermitage chapel on the hill or torr, called Tory Chapel. The view from the top was very fine, with the picturesque town of Bradford and its well built houses bespeaking the former importance and wealth of its inhabitants, below; the fine Elizabethan building, Kingston House, in the middle distance, and the range of the Wiltshire Downs forming the background to the view. The break was met on the top of the hill, and the members returned to Bath about 6 p.m. The day was lovely, and the corn, barley and oat fields waved gloriously in the breeze, betokening a rich and plentiful harvest.

The weather during the past year having been so remarkable, the following meteorological observations, made by Mr. Ernest Baker at the Institution and kindly presented by him for the use of the Club, is printed below.

During January atmospheric pressure was very unsteady, with a deep depression culminating on the 23rd, which was accompanied by heavy rains. The weather was unsettled and rainy throughout the month and extremley mild, the mean temperature being five degrees above the average. At the end of the month pressure rose and was high and fairly uniform throughout February. The monthly mean was the highest for the year, and on the 3rd the maximum 30·726in. was reached. At the same time the temperature fell, the wind, which had been chiefly westerly, veered round to the east, and the weather was generally cold and dry. At the end of the first week in March pressure fell, and continued very low and unsteady till nearly the end of the month. There were some days of severe frost early in the month, but the temperature quickly rose, and the mean for the month was 4·4 deg. above the average. There was a little snow and rain, but on the whole the weather was warm and pleasant. In April, pressure was still lower than in March, and was very irregular. The weather was comparatively colder, but the rainfall was not large. Frosts occurred at intervals this month, and even on the 2nd of May hoar frost was observed in the early morning. During the first half of May atmospheric pressure was low, and the weather was stormy and rainy. In the latter half pressure was higher, and the weather generally improved. From the 20th to the end of the month the weather was warm and brilliant. The temperature registered on the 24th inst., 76·6 deg., was the maximum for the whole year. In June, although the pressure was high and constant, the weather was stormy and wet. From the 10th to the 12th there was a slight depression, accompanied with heavy rain, and the same sort of weather prevailed through July. On the 17th of July a very heavy fall of rain occurred, the amount registered here being 1·570in. In June the mean temperature was above the average; in the next month it fell below. At the beginning of August there was a decided improvement in the weather, pressure rose, and the first week was warm and dry. On the 9th there was a heavy rainfall, and as pressure declined, towards the end of the month the weather became colder and more rainy. On the 30th hoar frost was seen on the grass. The autumn was the best part of 1890. Both September and October were unusually warm and fine. Atmospheric pressure was high and very steady throughout September, and was nearly as high, though not so steady, during October. There was very little rain, and the mean temperature was well over the average. At the end of October frost was experienced, and the fine weather began to give way. November opened with mild, rainy and foggy weather, the atmospheric pressure being very low. From the 12th there was a steady rise of pressure, and the temperature was also very high. On the 22nd pressure rapidly fell. There was snow on the 27th, and on the 28th began the remarkable frost which lasted with little intermission until the 20th of January, 1891. The minimum in November was 21·4 deg. Pressure was high and steady in the first half of December. From the 15th to the 20th there was a deep depression, after which pressure rose and remained high till the end of the month. There was a good deal of snow, and on the 20th the fall amounted to 1·105in. of water. The frost was most intense in the middle of the month, the lowest point 13·0 degrees being reached in the morning of the 23rd. The mean temperature was 31·6 deg., being 6·6 deg. below the average and 14·1 deg. below the mean for January in the same year.

Taken on the whole, 1890 was remarkable for the deficiency of its rainfall, for the abnormally mild temperature of January, and the still more unusual severity of December, for the rainy and unpleasant summer, and for the warm and dry weather of September and October. The rainfall of each month, except January, May, June and July, was below the average; that of February, September and October was extremely low. The degree of frost in December has never been equalled since observations have been taken here. The mean temperature for the whole year was 0·4 degrees above the average.

SUMMARY OF METEOROLOGICAL OBSERVATIONS FOR THE YEAR 1890.

Estimated height above Sea Level. Barometer, 101ft. Thermometer (verified at Greenwich), 71ft. Rain Gauge (8ft. from the ground), 75ft

1890	Barometer.						Mean calculated from 9 a.m. observation.			Self-Registering Thermometers.							Rain.	
		Maximum.		Minimum.														
	Mean at 9 a.m. corrected to Tem. 32° & Sea Level.	Absolute Maximum corrected.	Day.	Absolute Minimum corrected.	Day.	Range.	Temp. of the Air.	Dew Point.	Relative Humidity. (Saturation 100.)	Absolute Maximum.	Day.	Mean of Maxima.	Absolute Minimum.	Day.	Mean of Minima.	Mean Daily Range.	Rain and Snow in Inches.	No. of Days on which ·01 in. or more fell.
	In.	In.		In.		In.	°	°		°		°	°		°	°	In.	
January	29·948	30·433	31	**28·648**	23	1·749	45·7	41·2	85	55·2	7	49·2	21·6	2	39·5	9·7	3·171	20
February	**30·249**	**30·726**	23	29·595	15	1·131	38·2	34·4	86	51·0	18	40·1	26·4	28	34·0	6·1	0·690	5
March	29·880	30·521	3	29·165	16	1·356	46·1	40·9	83	59·0	28	50·5	18·0	4	38·5	12·0	1·277	10
April	**29·859**	30·340	1	29·330	15	1·010	46·7	39·9	80	64·6	30	54·2	30·2	5	39·5	14·7	1·244	14
May	29·867	30·312	22	29·436	10	0·876	55·6	43·5	65	**76·6**	24	63·2	38·4	31	47·0	16·2	2·549	12
June..............	30·204	30·422	15	29·273	30	1·149	57·6	51·5	80	72·2	25	65·6	37·6	1	51·9	13·7	3·747	15
July..............	29·938	30·244	21	29·324	1	0·920	**60·8**	53·2	76	72·4	22	66·7	44·6	12	53·8	12·9	3·589	18
August	29·912	30·256	4	29·452	27	0·804	60·4	52·6	75	74·0	7	66·7	41·0	30	53·3	13·4	2·379	14
September	30·170	30·492	26	29·617	20	0·875	60·3	54·5	83	74·4	9	67·4	37·4	1	51·9	15·5	0·985	8
October	30·161	30·554	22	29·485	26	1·069	51·0	45·7	82	64·0	4	57·3	30·8	30	43·0	14·3	0·983	11
November	29·922	30·532	20	29·285	2	1·247	44·3	40·6	87	58·0	14	49·6	21·4	29	39·3	10·3	2·001	15
December	30·056	30·379	24	29·286	19	1·093	**31·6**	27·1	82	44·2	1&4	34·2	**13·0**	23	26·6	7·6	2·046	11
Means & Sums	30·014	30·434		29·328		1·106	49·9	43·8	80			55·4			43·2	12·2	24·661	153

The Library of the Club continues to receive many valuable additions from the U.S. Geological Survey and from other societies with which a mutual exchange of publications takes place. Owing to the many alterations effected in the Literary and Scientific Institution during the past year, an arrangement has been made with the authorities, whereby, for the annual payment of £5, the Field Club has secured the use of the Lecture Hall for its Afternoon Meetings and of the Conversation Room for the Annual, Quarterly and Committee Meetings. In this latter room the Library will be placed, so that the books will be more accessible to the members than they have hitherto been. The members also of the Institution have the privilege of referring to, but not of taking them away. From the annual statement of accounts appended, it will be seen that there is a balance in favour of the Club of only 6d. This may be accounted for by the exceptional expenditure arising from the subscription of £5 towards the Scarth Memorial Window, erected in St. Mary's, Bathwick, and from the sum of £9 expended in the purchase of an oak bookcase, items which will not occur again.

H. H. WINWOOD,

Hon. Sec

30 JUN. 92

The Honorary Treasurer in Account with "The Bath Natural History and Antiquarian Field Club," for the Year ending February 18th, 1891.

Dr.

	£	s.	d.
Balance from last year's Account	14	8	11
91 Subscriptions at 10s. (includes 2 for 1889) ...	45	10	0
6 Entrances at 5s. (includes 1 for 1889) ...	1	10	0
1 Subscription Unpaid			
	61	8	11

	£	s.	d.
Deposit Note—Post Office Savings' Bank ...	40	0	0
Interest to 19th March, 1890	3	16	6
	43	16	6

Cr.

				£	s.	d.
Donation to the Literary and Scientific Institution				4	0	0
Gratuities ditto and Clerk for addressing Cards ...				1	5	0
Ditto at Excursions				2	1	0
Donation—Broome Collection Fund				1	1	0
" Fairford Church Restoration Fund ...				1	1	0
" Scarth Memorial Fund				5	0	0
Purchase of Book Case				9	3	0
Messrs. Lewis and Son, viz.,						
Printing Proceedings & Postage of do.	27	3	6			
Cards, Circulars, &c.	9	17	3			
				37	0	9
Postage—Secretary, Treasurer and Institution ...				0	16	8
Balance in hand				0	0	6
				61	8	11

Examined and found correct, 17th Feb., 1891,

R. L. TAYLOR.

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PROCEEDINGS
OF THE
BATH NATURAL HISTORY
AND
ANTIQUARIAN FIELD CLUB.

VOL. VII, No. 3.

1892.

BRITISH MUSEUM
NATURAL HISTORY

PRICE HALF-A-CROWN.

BATH:
PRINTED (FOR THE CLUB) AT THE HERALD OFFICE, NORTH GATE.
1892.

Stray Notes on Bath Books. *By* F. SHUM, F.S.A.

—xrf

(*Read March* 18*th,* 1891.)

It is singular that although Bath is noted for its antiquities and distinguished by its connection with the earliest English writers there are no early Bath-printed books.

The connection of this city with ancient English literature is no idle boast for the first English author was undoubtedly Gildas, who flourished in the 6th century and was known by two surnames; sometimes he was styled Sapiens, at other times Badonicus, the last indicating either his birth or his residence in this locality.

In the 10th century within a stone's throw of the building in which we are now assembled there was a well endowed monastery over which the celebrated Elphege held sway and the rules of which he rigidly reformed. He was born in the village of Weston hard by; from this Bath monastery he was summoned to preside over the see of Canterbury, and while holding that high office, and in discharging its duties, he was cruelly murdered by the Danes. In the reign of Henry VI. lived a distinguished writer Thomas Chandler, the author of a work on the two cities of Bath and Wells, which was known in Leland's time, but is not now extant. It was entitled "De Laudibus Bairorum et Fonticulorum Civitatum." In addition to these there were three notable names about the 12th century, John de Villula, Adelard styled Athelardus Bathoniensis, a great traveller and linguist as well as a mathematician, and Peter of Blois better known perhaps as Peter Blessensis, who for 26 years was Archdeacon of Bath, and afterwards Archdeacon of London. Learned, but poor all his life long, he was anxious at the close of life to retire to his native city of Blois; he appealed in vain to the Pope, in whose defence he had employed his pen, for pecuniary aid; he died in this country in 1200. His authenticated works in the edition now on the table were published in 1847, more than 600 years after his death.

After the close of the Saxon and Norman periods there was a succession of eminent Bath authors in the 16th and 17th centuries. The most remarkable and one of the earliest was Dr. Turner, Dean of Wells; Sir John Harington, Samuel Daniel, the ever memorable John Hales born in Bath and educated at the Grammar School, also Alexander Hume, a Bath schoolmaster, author of the " Orthographie and Congruitie of the Britan tongue a Treatise noe shorter than necessarie for the Schools."

Notwithstanding this early association of Bath with literature, the date of the earliest book printed in Bath in the British Museum is 1733, and in the 1st vol. of the Proceedings of the Library Association this date is quoted as the first work printed in this city. I have, however, in my collection of Bath books a volume printed in 1730, and this I take to be the first printed here. It was written by Robert Spurrell and entitled "The Elements of Chronology, or the Calender explained; dedicated to the Right Worshipful the Mayor of Bath and to the Worshipful John Billing and Thomas Attwood, Justices and the rest of the Corporation of the City of Bath."

Is it not passing strange that this little modern 12mo. volume looking like a thing of yesterday is the earliest specimen we have although the art of printing was introduced in this country three centuries before! How is it to be accounted for? The inquiry is worth following. Notwithstanding printing was invented and practised on the Continent before it was known in England no resistance was offered to its introduction although the work was carried on by foreigners, on the contrary, every encouragement was given to the strangers to exercise their calling in England not only by influential laymen but by the ecclesiastical authorities, in their different foundations. On referring to a list of those places in England where printing-houses, as they were then called, were first established, it will be seen that in most cases they were situated in the vicinity of some monastery. In Oxford we find one of these printing-houses in 1468, at S. Abans in 1480, Cambridge in 1521, Abingdon 1528, Ipswich 1548, Carlisle 1549.

As early, however, as 1533 the jealousy of Englishmen was aroused by the number of foreigners engaged in the art, and most stringent measures were taken both to confine the printing-houses in England to fewer masters, and to discourage the sale of printed books from beyond sea. In that year, 1533, an Act was passed cancelling all former privileges, and constant efforts were made to discourage the exercise of the art of printing in all provincial towns. During the next 50 years printing-houses that had been worked in York, Ipswich, Canterbury and Norwich were no longer employed, and in 1583 the legislature passed another act forbidding the use of printing-houses in all towns except in London and the two Universities of Oxford and Cambridge. During the Civil War, printing-presses were carried about to divers places, and those versed in the literature of the Marprelate times are well acquainted with the scurrilous and bitter controversies of the Puritans and Episcopalians, contained in pamphlets and books under the most quaint and grotesque titles, some of which were issued from the contending armies in the Civil War. A catalogue of the titles only would make an amusing volume; some years ago I commenced one but had not time to complete the collection.

In 1649, Parliament, then in possession of York, passed an ordinance allowing, as a great favour, one printing press in that city and one at Finsbury, in addition to those of London and the two Universities. Restrictions were carried still further, and in 1662 an act was passed which stipulated that, "no person within the city of London or the liberties thereof, or elsewhere, shall erect or cause to be erected any Printing-house, unless notice shall first be given to the Master or Wardens of the Company of Stationers" . . . "And from the time to come no man shall be admitted to be a Master Printer until they who are now Master Printers shall by death or otherwise be reduced to the number of twenty and from thenceforth the number of twenty shall be continued and no more, besides the King's Printer and the Printers for the Universities."

It was not until 1693 that the privileges of these monopolists were abolished, and the art of printing became free. At the close of the 16th century presses were established in Exeter, Plymouth and Shrewsbury, and even so late as 1724 it was recorded that there were only twenty-eight Printing-houses in England.

These facts show the existence of an arbitrary monopoly, and I think fully accounts for the rarity of early printed books in Bath and other ancient towns where they might naturally be looked for. For nearly two centuries Bath has been more or less a fashionable resort—a centre of attraction for the idle and wealthy, and has, therefore, been regarded a city of luxury, rather than a seat of learning. On the other hand, some circumstances point to a different conclusion. It may be shown, that although there was much frivolity and trifling, as exhibited and caricatured in the novels of Mrs. Bayfield, Miss Austen; in the poems of Christopher Anstey, and in the heroico-odico-tragico-comico poem written by the Rev. R. Warner, who, under the nom de plume of Peter Paul Pallett, satirically proclaimed the three Bath Deities to be "Humbug, Follee and Vanitee," yet, nevertheless, there was a leaven of culture and scholarship even in those days. For with the constant influx of the wealthy and the aristocratic there has also been a large number of the well-to-do middle class from all parts of England, from India and the Colonies who, with a view to rest from their professional and commercial engagements, have settled in Bath and spent their remaining years in ease and retirement; freed from toil and anxiety they have found resources in literature and science. In addition to these, many scientists and litterateurs have also been attracted to this city and continued their researches and pursuits, and written works of great value, so that we have not been without a succession of eminent authors in Bath from the days of Fielding, Smollett, Hartley, Cogan, Herschell, Warburton, and Melmoth, down to the time of Walter Savage Landor, and Bishop Thirlwall, who when towards the close of a long and studious life, settled down in the centre house of Pulteney Street, where he stored his large collection of books, and surrounded by them wrote his last article within a few days of his death.

One remarkable characteristic of our local literature is the wide range of subjects embraced. In History, Philosophy, Philology, Natural History, Poetry, Botany, Stenography, Political Economy, Travels, Biography, and Topography, several noteworthy books have been written by Bath men.

In ecclesiastical lore and religious controversy there has been an overwhelming abundance. In theology, both practical and doctrinal, there has been a plethora—no end of essays, treatises, lectures, expositions, charges and sermons—more than enough to have made the past generations of Bathonians better men than they *were*, and the present race much better than they *are*.

The County of Somerset during the 16th and 17th centuries was remarkable for the number of eminent divines who were distinguished by their learning and renowned for their zeal and piety—Ken, Kidder, and Hooper, Bishops of Bath and Wells, Allein of Taunton, Bernard of Batcombe, the author of a work that suggested Bunyan's "Pilgrim's Progress," Roberts and Crooke, able scholars, who were successively Rectors of Wrington, predecessors of our late chairman, Prebendary Scarth; Jeans of Chedzoy, John Norris of Newton St. Loe, Glanvill and Coney, Rectors of Bath, and Carte, the distinguished historian and lecturer at Bath Abbey Church, besides several others whose names will recur to you.

Moreover in two or three branches of science and literature Bath may fairly claim some notable pioneers. Dr. Turner was far in advance of his time. He was the father of English botany, and the author of the first botanical work containing the recorded localities of our native plants. Sibthorp, almost equally eminent as a botanist, lived and died in Bath. In astronomy, we have Herschell with his wonderful telescope, constructed in his residence at New King Street, where he discovered the Georgium Sidus; while living in Bath he contributed papers to the Royal Society as well as to the Bath Philosophical Association, of which he was a member. To these may be added the name of W. L. Bowles, who has been styled the father of modern English poetry, and W. Smith, the father of English geology; Miss Lee, author of the first historical novel, and Pitman, inventor of the best system of Shorthand, now almost universally adopted in England and America.

The extensive ground covered by local authors renders it difficult to compress within the limited time any satisfactory notice of their works, I have therefore selected only a few of the most valuable and curious, limiting the period to the 16th and 17th centuries, and leaving later publications for a future occasion. These are now before you; many of them scarce and original editions; one or two of them recently printed for the first time, centuries after the death of the writers; a few others are modern reprints.

Gildas Badonicus, Peter of Blois, Turner, Dean of Wells,
circa 512–570. circa 1140–1200. 1520–1568.

Sir John Harington, Samuel Daniel, John Hales,
1561–1612. 1562–1619. 1584–1656.

Prynne, Francis Roberts, H. Jeans, R. Alleine,
1600–1609. 1609–1675. 1611–1662. 1611–1681.

J. Alleine, Bishop Ken, Glanvill, Bishop Kidder,
1634–1668. 1637–1710. 1636–1680. 1663–1703.

John Norris, Matthew Hole, Arthur Bedford,
1657–1711. 1637–1730. 1668–1745.

Wm. Goulde. 1658–1686.	Humphrey Chambers. circa 1600–1662.	Bishop Hooper, 1660–1727.
	T. Carte, 1686–1754.	

A brief history of the above authors, locally connected with Bath, and an account of their works was given.

Remarks on the Distribution and Movements of British Animals and Plants, in past and present times, as instanced in the Nightingale and some other cases.

By the Rev. Leonard Blomefield, M.A., F.L.S.

(Read November 11*th,* 1891*).*

The above is perhaps the most appropriate title for my paper, which has reference to a subject I incidentally alluded to in a lecture read to the Selborne Society in May last. On that occasion I spoke of the great disproportion there was between the number of birds in the W. of England (referring to Bath especially) and those in the eastern counties; I meant the number of individuals—not the number of species.

I would now enter more fully on that subject, and endeavour to explain it, so far as recorded facts and circumstances allow. For this purpose it is necessary to say a few words in the first instance on the prehistoric condition of Great Britain as stated by geologists. Lyell, whom I presume we may consider as an authority in this matter, treating of the glacial period, speaks of frequent changes of level—sometimes bringing about the union—at other times the disunion, of the British Islands with each other as also with the continent; and he considers it probable that the first introduction of a portion of our British fauna may date from that period.* This may be true to some extent; but the first appearance of *birds* in England must have been earlier, as their remains occur in the London clay of the Isle of Sheppey, where they are mixed up with vegetables and fruits.†

It is unnecessary, however, to say much on this part of our subject. Such of our native birds as were not in this country at the time of its final disunion with the continent, probably entered soon afterwards—or what is not unlikely—flitted backwards and forwards at will, especially the migrating species.

Now suppose a certain number of such birds were to arrive in this country from the Continent for the first time and at about the same time; say nightingales, which species I select, for illustration of what I have to say, as being one whose range over England has perhaps been better determined than that of any other of our summer migrants. They would arrive in the first instance on the shores of the eastern and south-eastern counties, where they would settle down immediately—if they found all that was necessary for their support and comfort. What would they require and look for? *Climate*—of a temperature agreeable to their feelings; *food*—such as they had been used to; *shelter*—and especially such shelter as would be suitable for nidification. If the place in question supplied all these wants there they would remain; though the seasons might not be all alike, and they might be compelled to shift their ground in winter from cold or want of proper food, and go further S. returning to their former haunts in spring.

Suppose now additional birds of the same species were to arrive in course of time on the same parts of our coast. It is evident that an unlimited number of birds of the same species could not be maintained at the same place. Those that came last might be as it were crowded out, and be compelled to push on further into the country till they found a proper resting place. After such a circumstance often repeated, it is evident that the nightingales might be spead further and further over England, becoming more scattered and thinned in numbers, until at length there were scarcely any to be found; their habits and the required food imposing a limit beyond which they would very rarely venture. To a certain extent what I have said may be illustrated in a very homely way. Some of us may have occasionally seen a shepherd standing at the gate of a rich pasture, with his flock pressing behind anxious to get in. On his opening the gate the foremost sheep rush in, and immediately lower their heads to feed upon the fresh grass, so welcome after travelling—perhaps some little distance—along the dusty road. Others follow, but have to push their way through the first lot to get at the grass that lies beyond, and so on until they have all got in and had a bite, the sheep by this time being pretty equally scattered over the field. Here the parallel between them and the nightingales would end, from the limitation imposed upon the sheep by fencing and for other obvious causes.

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* See *Elements of Geology* pp. 158—160; also *Antiquity of Man,* chap. xiv.

† *Elements,* p. 290.

To return to the nightingales, let us now take note of the counties in which they are more or less frequent. They abound in the E. and S.E. counties, which we might call their head-quarters. In Kent and Cambridgeshire—the two counties in that part of England I am best acquainted with—the copses, hedges and plantations, in the early summer, resound with their song night and day; mixed up during the day with that of numerous other song birds—some natives, others migrants—the former, though much more widely distributed over England than the nightingales, still abounding in their greatest numbers where they first alighted on our shores. No such concert was ever heard in Bath, nor anything approaching to it. It quite realizes the lines of Cowper :—

> "Ten thousand warblers cheer the day
> And one the live long night."

But to proceed with our subject. Passing on from the eastern and south-eastern counties, nightingales are found in many of the midland counties, but the numbers become less and less as we approach the west and the north. They occur sparingly in Herefordshire, Monmouthshire, Salop, Staffordshire, Derbyshire and Yorkshire, but not further north than the neighbourhood of Doncaster, this being the limit northwards according to Selby.* The western limit of the nightingale is on the borders of Somerset and Devon, or "the Valley of the Exe," as stated by Newton. It is local and rare in the north of Somerset; in the neighbourhood of Bath, according to my own experience of forty years, it is decidedly rare, and of very uncertain occurrence. I used formerly, when resident in Bathwick, to hear it occasionally most years about Bathwick Cemetery and in hedges on Bathwick Hill; but since my removal to Belmont my experiences as to this bird have been very scanty indeed. I never heard it in the Park except once in the den among the firs; oftener among the shrubs and little plantations in connection with the houses on the other side of Park Lane; and once above the High Common, bordering on Sion Hill.

The nightingale has never been seen in Ireland, nor I believe in N. Wales. It is *said* to have been heard in Westmoreland and Cumberland, and even in Scotland, but these statements want confirmation. It is remarked by Professor Newton that "nearly all birds have a definite range which they rarely overstep." The nightingale is no exception, and its distribution is limited. Selby thinks there must be some "undiscovered circumstance in the economy of this and other species that must be the cause of their partial distribution." He says "it cannot be *climate* in the case of the nightingale as it is found in countries further north than

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* I may state that my chief authorities, as regards the Nightingale Districts, have been Selby and Newton in their respective works on British Birds.

England; such as Sweden and the northern parts of Germany." My own opinion is that the limited dispersion of the nightingale has nothing to do with climate or food, but is simply in connection with distance from that part of the country where they first landed from the continent. There will always be some birds of a more venturesome spirit than others, who feel an impulse to push on beyond the range of country they are ordinarily confined to. Just as among ourselves there are some bold travellers who like to explore regions that have never before been visited by man; or—what is perhaps a more exact parallel—like stray birds of various species which, in several instances, have occurred only once or twice in this country from accidental causes. Any of our native birds might in like manner overstep the boundary of their usual haunts, though compelled to return sooner or later from want of proper food or shelter, or in order to secure their safety.

What has been said hitherto relates to the nightingale alone, one of our most regular and most interesting summer migrants. But there are some irregular and very remarkable movements occasionally observed in the cases of other of our song birds, which ordinarily remain with us the whole year, that quite deserves mention. Thus the thrush and the blackbird, as a rule, do not quit our shores on the approach of winter. But they are species widely dispersed over Europe, and those found in countries north of England are compelled to migrate in autumn, often appearing for a short time in large flocks on our shores, where they get mixed up with our own birds, many of which join and accompany the foreigners in their journey southward.

A more remarkable case is recorded by Selby respecting the gold-crested Regulus. This bird, though "the most diminutive of all our British birds, is yet of so hardy a constitution, as to brave the usual rigours of our winter. It is equally dispersed through England and Scotland, extending even to the Orkney Islands, where it is also indigenous." The particular circumstance alluded to above is thus spoken of. "On the 24th and 25th of

October, 1822, after a very severe gale, with thick fog, thousands of these birds were seen to arrive upon the sea-shore and sandbanks of the Northumbrian coast; many of them so fatigued by the length of their flight, or perhaps by the unfavourable shift of wind, as to be unable to rise again from the ground, and great numbers were in consequence caught or destroyed. This flight must have been immense in quantity, as its extent was traced through the whole length of the coasts of Northumberland and Durham. There appears little doubt of this having been a migration from the more northern provinces of Europe, from the circumstance of its arrival being simultaneous with that of large flights of woodcock, fieldfare and redwing."*

And I cannot forbear mentioning yet another most remarkable movement of a species of bird—till lately, not only a stranger in this country, but strange to the whole continent of Europe. I refer to the sandgrouse, of which an account was given by Professor Newton to the Biological Section of the British Association at the Bath Meeting in 1888.† This bird is a native of the large sandy deserts in Central Asia, where it was discovered by Pallas, the great German naturalist and traveller, towards the close of the last century. It had rarely been seen in Europe previous to 1863, when there was a great irruption of this bird spreading in various directions, and another equally great in 1888. It has occurred at times in various parts of England, Scotland and Ireland, and in one instance at least has stopped to breed. In a letter from Professor Newton dated September, 1889, he mentions having obtained "a young bird, not above two or three days old, caught in Scotland, and proving that the invaders had bred with us."

Much has been said, of course, as to the probable causes of these large irruptions of sand grouse, over so wide a territory into which they had never entered before. My own belief is in accordance with that of Newton, who attributes it to an overflow of numbers in their native country — "a redundant population" he calls it. When we think of the great sandy deserts in Central Asia, which these birds have occupied, with little or no interference on the part of man, for hundreds —or it may be thousands—of years, we may imagine what their numbers must amount to at the present day: and when we take also into account their scanty means of subsistence in those arid lands, is it surprising that those birds nearest to the European borders should venture to overstep their usual range, as occasionally done in other cases spoken of above? And the movement once begun, others, copying after them, soon follow. At the same time it might be suggested, as another likely cause of the movements of these birds, that civilisation is beginning to press hard upon the domain they have so long had themselves, forcing them to make way.

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* *British Ornithology*, Part 1, p. 193.

† *British Association Report*, 1888, p. 703.

Before quiting this part of the subject proposed for consideration in my paper, I may remark that the same reasoning and research employed in the earlier part of it, when speaking of the nightingale more particularly, might be availed of in the case of all our other British animals; the facts, however, wanted for the purpose would be very numerous and difficult to get together, and when obtained would require volumes for a record of the same, instead of a mere Field Club paper.

I will pass then now to the second part of my subject, the distribution and movements of British plants. Here, however, I shall confine myself to a few only of the more remarkable cases which might be adduced in illustration of the subject I am considering.

I would first call your attention to barley grass *(Hordeum murinum)* a very common weed in the eastern counties, growing by the side of almost every path and road in abundance, as well as under barns and cottage walls. The difference between E. and

W. in the case of this grass is remarkable. Babington, when he first published his "Flora of Bath," in 1833, impressed by the fact of its abundance in Cambridgeshire, seems to have taken for granted that it was equally abundant about Bath. He says of it—"Not uncommon on waste ground." He discovered his mistake, however, before issuing his supplement in 1839, in which he speaks of it as "rare," giving only a single habitat—"By the river-side at Twerton bridge." And it is a fact that neither the late Mr. Broome nor I, he having explored the botany of the Bath neighbourhood for many more years than myself, ever found a single specimen. The above given habitat, therefore, is the only one, so far as I am aware, at present known for it. It is plentiful in the churchyard and neighbourhood of Bitton Church, where it was found by our vice-president, an excellent botanist, who will doubtless have something more to say about it, and from which locality I obtained specimens. But Bitton is in Gloucestershire and not Somerset, and hardly perhaps ought to be considered as within the Bath district. At the same time it is an interesting fact in connexion with the subject of the ranges of British plants, and I may have occasion to return to it.

I would next call your attention to the case of the Annual Dog's Mercury *(Mercurialis annua).* Of course all our plants, no less than our animals, came originally from the continent, with the exception of a few, such as the *Mimulus* and *Œnothera*, which have been imported from America. Assuming this, the case of the *Mercurialis annua* is curious, as being just the reverse of that of the *Hordeum murale.* The latter, as mentioned above, is ubiquitous in the eastern counties, but very rare about Bath. The former, the Dog's Mercury, is said by Smith in his "English Flora" to be not common, whereas here in Bath it is a troublesome weed in gardens, and to be found on all waste grounds. In fact, in the case of this plant east and west are quite disregarded. More might be said upon the subject of these two plants, as also upon other plants, remarkable in respect of their locality, but I should be repeating much that I have said on a former occasion in a lecture on the "Flora of Bath" read to the members of this Club some years back;[*] and to which I refer my hearers. I therefore pass on to the consideration of a more general question, perhaps also one of more general interest, viz., what are the causes that have operated—and which are still operating—to bring about the distribution of plants in the British Islands as we see them at the present day—some scattered about everywhere—others more or less collected in certain places far apart from each other, or, as happens in certain instances, confined to a single locality?

To solve this question two things must be taken into consideration. First, we must remember the ages that have elapsed since our Islands received their first instalment of plants from the continent; and then consider the multitude of causes that have been unceasingly at work to disturb them in the localities in which they first took root. Man, I imagine—after his own first appearance on the stage—has here been the chief agent. Think of the state of England at the present day. Think of the large towns and villages man has built—the former sometimes extending for miles into the surrounding country—to say nothing of manufacturing erections and tall chimnies, vomitting forth a black smoke deadly poisonous to very many plants—think of the thousands and thousands of acres given up to agriculture and gardening, all the native plants having been turned over or eradicated altogether—the heaths, commons, and various open spaces, from which nature has been expelled, and forced to make way for man and his artificial—as well as real—wants. Think again of the roads and railways running in all directions over the whole kingdom, like the web of some huge spider; and, what is very curious, on the side embankments of some of these railways, you may occasionally stumble upon plants never seen nor met with before in the district—showing how they have been dispersed and hurled about from one place to another through the operations of man. Lastly, consider the bogs and fens that have been drained, and the woods that have been cut down, the habitats formerly of some of the rarest and most interesting species.

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[*] Proceedings of the Bath Field Club, vol. 1., p. 25.

And there is yet another cause of the disappearance of some species of plants, at least in the eastern counties, viz., enclosure. By this word I do not mean simply the conversion of open country into cultivated districts, but hedges now so generally adopted for marking off the boundaries of arable fields. Formerly, in Cambridgeshire at least, to which alone my own experience refers, the cornfields, even those of different proprietors, were separated from each other by a strip or ridge of the original land, such as it was before any cultivation of it had taken place. These strips were called *balks*, and the wild plants that grew on them—some no longer to be obtained—had remained there undisturbed—it may have been—for centuries.

From all these causes combined, the Flora of Great Britain must be very different now from what it was formerly, at least as regards the distribution of species and the localities in which they were once found. I would here mention an incident not altogether unconnected with what has been said above. My friend, the late Mr. Broome, and I some years back went to Limpley Stoke at the request of a lady resident there, who wanted us to see and determine a weed that had appeared in her garden. I should state that the house had not been long built, and the garden had only been made that same year out of a ploughed field. The plant proved to be *Erysimum orientale,* not mentioned in all our English Floras, and only noticed in "Hooker's Student's Flora," in the appendix, as an *alien ;* that is a stranger accidentally introduced. Yet surely it is hard to say what plants are to be considered as aliens, and what as true natives, seeing that all our plants must have come from the continent formerly, and how conveyed to the spots in which we now find them it is impossible to say. Thus in the present instance, I have a specimen of the *Erysimum orientale* in my herbarium gathered on the sea-cliff at Sheringham, near Cromer, so far back as 1829, and a few other localites are given for it (chiefly in the eastern counties) in Smith's English Flora, though not mentioned in Trimmer's Flora of Norfolk. Here then we have nearly the whole breadth of England lying between the eastern and western stations for this plant;* which taken in connection with the strife and struggle our plants have had to sustain over long periods of time, from one or more of the causes spoken of above, we cannot wonder at any anomalies that occur in respect of the situations in which we now find them, or say how long they may have been hid from view, yet with the living principle still in them, ready for development at any time, the surrounding conditions being favourable.

While in the case of some species, as in that last noticed, the localities in which they occur are widely apart, other plants have been driven up into corners, and become so extremely rare as to be on the verge of extinction altogether. I have heard that the beautiful Lady's Slipper, *Cypripedinm Calceolus*, is now confined to a single wood in Yorkshire, in which it is strictly preserved, as quite right it should be, by the owner of the property. I myself am fortunate in possessing fine specimens of two other plants which are extremely rare, if indeed they still exist. One of these is *Orchis hircina*, which was given to me more than half-a-century ago by a botanist in the neighbourhood of Dartford in Kent, where I was visiting, and who told me he had gathered it in a wood near his house, where he did not think it was any longer to be found. The other plant alluded to above is the *Senecio paludosus*, a fen plant almost extirpated by drainage. It was not drainage, however, which destroyed the locality in which I obtained my specimens. The circumstances were as follows. A friend of mine, a botanist, resident at Ely (it was in the year 1833) told me of a fen ditch not far out of the town, in which there were several fine plants of the *Senecio paludosus.* He kindly took me to the spot, and I was gratified at the sight of so rare a plant still growing there, never having been disturbed. I cut two fine specimens, leaving the root—one for my own herbarium, and the other for my friend Broome, in whose collection I presume it still exists. Very soon after this the rails from Cambridge to Ely, which had been in progress some time, cut through the ditch and there was an end of the plant for ever in that locality. My friend informed me afterwards that he knew of no other locality for it in Cambridgeshire. It may still exist in the Fens of Lincoln, but in Hooker's Flora it is said to be "now almost extinct."

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* Since I first wrote the above I find Cardiff mentioned as a locality in which it has occurred.

Another instance of the destruction of our native plants by ingress of the rail may be found in our own county of Somerset. Broome and I twice made a botanical excursion to Shapwick Moor and Glastonbury. The first was in July, 1855, when the moor was in its original state, on which occasion we found more than twenty species of plants not to be met with about Bath, many of them rare and local. We visited the moor again the year after, when a change in the place had already commenced and we missed some of the rarities found on the occasion of our first visit. A very few years after the moor was almost entirely cleared away for the introduction of the rail and a railway station.

Another and the last case I would mention on this subject, in which the locality was destroyed—though fortunately a good number of specimens were secured first—is that of the *Holosteum umbellatum;* a small delicate little plant found on old walls, and very rare in this country; being confined to Norwich and one or two other old towns in the eastern counties. A few years back Mr. Trimmer, the author of the "Flora of Norfolk," kindly sent me a considerable number of fine specimens of this plant from an old wall in Norwich, which he was just in time to gather before the top of the wall was scraped and cleaned by the mason's trowel. He said he knew of no other locality for the plant in Norwich.

I would now speak to you of a very interesting little plant, not very uncommon in meadows and chalky downs, which moves of itself and changes its place without the intervention of man. It is the *Herminium monorchis*, the specific name having reference to the peculiar structure of the root. In our other British species of the restricted genus Orchis, if dug up in the flowering season, you will find the root to consist of two tubers, one of which supplies the flower of the current year, the other being reserved for the year after. If you dig up the *Herminium monorchis* when in flower, you find but one tuber; there are other roots, however, of a fibrous character, one of which gradually elongates in a horizontal direction, till after a few weeks or so the tip thickens, swelling at last into another tuber from which springs the plant of the next season, of course removed an inch or more from the site of the first plant. In this way, then, the plant in course of time may traverse a whole field; and ultimately disappear, along with any other specimens in the same field. And this may have been the case to a certain extent in a field from which Broome and I obtained our specimens; for, a few years afterwards, on my inquiring about them, he told me he could hardly find any.

This part of my subject would be left imperfect if I made no mention of the plants introduced into this country, unintentionally, by man or from other accidental causes, to take the place, as it were, of those which have been lost to our Flora. I need not say much as regards the Bath Flora, having spoken of it before at some length in a previous lecture referred to above. I may add, however, to that statement that there are three plants in my herbarium, gathered in this neighbourhood, foreigners, and not mentioned in any British Flora. One is a composite plant, which Broome, who first pointed it out to me in 1871, growing by the river's edge at Batheaston, said it was the *Cacalia hastata*, but I am not quite sure that it bears that name at present. It seemed to be quite naturalised, but whether it is still to be found there I am not aware.* The second foreigner is *Levisticum officinale,* found by the canal side near Bath in 1872. This plant is found occasionally in old gardens and may have been an escape. The third is *Rapistrum rugosum,* of which several specimens were found in cornfields at Batheaston in 1869; no doubt introduced with seed corn, as in many other cases. Some years back a "Floral Immigration at Mitcham in Surrey" was recorded, in which more than forty species of new plants had sprung up in the neighbourhood "through the agency of the foreign grain trade." Again—quite recently—I was told by the late Director of the Royal Kew Gardens, that he had brought away with him from Kew a number of plants for a new garden at his present residence in Berkshire, and he now wished that he had left some of them behind, from their having become perfect weeds springing up everywhere and giving much trouble.

There is one more foreigner to which I must draw your attention, more remarkable than any I have yet noticed—the *Epipogon Gmelini.* It is a leafless species of orchis, called by Hooker in his "Student's Flora" a *saprophyte,* from its growing on dead leaves and other decayed matter. It is well figured in Curtis's Botanical Magazine,† from specimens "found at the foot of a very steep woody bank, close to a brook, the soil being very wet and stiff, at Tedstone Delamere in Herefordshire." This plant had never before been met with in this country, nor has it ever been met with since. It has a wide range in the northern parts of Europe and Asia, but is accounted even on the Continent as very rare. What can have brought it to this country, and how conveyed so far away from the east coast as Hereford, without finding a resting-place at any intermediate station, is a problem not very easy to solve. I would suggest however that, being a "saprophyte orchis," as called by Hooker, and found "amongst decayed leaves," it had been quite accidentally introduced along perhaps with vegetable manure of some kind attached to, or purposely brought in with other foreign plants. It may be mentioned in connection with such a circumstance that in the appendix to the "Student's Flora" a few other plants are mentioned which have not been met with in the British Islands more than once.

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* Mr. Inman informs the Editor that it is still found there (H.H.W.)

† Vol. 80, tab. 4821.

Leaving now all further consideration of particular plants, I conclude my Lecture with a few general remarks. We have seen how, from various causes, our British Flora is yearly undergoing changes; how some species are slowly dying out, while new ones imperceptibly creep in to take their places. Now a register of such changes should be kept as far as circumstances allow; and it is a subject which of all others, it belongs especially to the Natural History Field Clubs to investigate. So far back in time as 1834, I brought this subject under the notice of the Berwickshire Naturalist's Field Club—the parent of all the many Field Clubs that have since been started—at one of their Anniversary dinners, to which I had the honour—in company with my friend the late Mr. Yarrell—of being invited. The same subject has been more prominently brought to the front of late years by the British Association, and discussion, as well as correspondence relating thereto, has taken place at their annual meetings. Are there no botanists in Bath who will give their attention to the matter, and lend a helping hand in the interests of science? Is there no one member of our own Club present in this room, who, at the request of the British Association—I may add at the request also of their president—never likely to address them again—will note and register the blanks and additions observable in our local Flora from time to time—a pleasant object one would think, during the spring and summer months, for a weekly walk or excursion.—*Verbum sapienti sat est.*

Old Field Names. By REV. CANON ELLACOMBE, *Vicar of Bitton.*

(Read December 16th, 1891.)

It is now many years since Dr. Prior, writing to me on plant names, suggested to me that I should look after the Old Field Names in my parish. I saw at once that it might be a curious and interesting subject of inquiry, but I never followed it up, till accident almost forced it upon me. This year a new Tithe Act was passed, which has obliged Tithe owners to look up their Tithe Commutation Awards. As I looked through mine of 1843, I was struck with the great number of names that were unknown to me, and which I could see had in many cases passed away; and thinking of Dr. Prior's suggestion, I went through them more carefully, till I came to the conclusion that the search which had interested me might help to pass one of our winter afternoons in the Bath Field Club, and might, perhaps, be made interesting to some of the members. *Hinc illæ chartæ.*

The subject is a very large one, and to write anything like an exhaustive account would require a volume, and a very large volume, for I think it likely that in every parish in England one or more field names would be found, peculiar to that parish and found nowhere else. I shall almost entirely confine myself to my own parish of Bitton, and even there the amount of material is so large, that I am more afraid of wearying you, than of finding too little to fill up our usual length of paper.

I think the simplest way will be to take first the general names, and then the more particular and special names. By general names I mean such as are more or less in use all over England; words which we may call generic, applied to a vast number of fields, and marked off to special fields by some distinguishing adjunct. I mean such words as field, meadow, close, leaze, tyning, paddock, barton, hayes, etc. These all sound very simple words, not worth dwelling upon, but they are all old English words, each with its own history, and each worth stopping with for a short time.

Field is of course the largest of all. It is a genuine old Saxon word, found in all the northern nations of Europe in the different forms of field, feld, veld, velt, etc. It is generally joined with some word showing the size or shape, as ten-acre field, six-acre field, long field, broad field, (corrupted as a place-name to Bradfield), 3-cornered field, etc.

Meadow, or Mead, is another very old English word. It occurs in several of our oldest authors, and in the different vocabularies it is always given as the translation of *pratum*, and in them we also find mention of the meadow-sweet or meadow-wort, which I have no doubt is the same plant which we now call by that name.* And the English meadow was exactly the Latin pratum, cultivated ground for grass only, and not brought under the plough and so always green, (Cicero speaks of *pratorum herbescens viriditas*).† And this was certainly the English meadow, which in its A. S. derivation is the mowed ground. The meadow was always a pasture of large extent (" wide-skirted meads " is Shakespeare's description), yielding a quantity of rich but not very superior grass. In our part of the country the meadows are all lowland pastures, and hay dealers draw a wide distinction between upland and meadow hay.

Close is also an old English word, though it is derived directly from the Latin *Clausura*, or *locus inclusus*. It probably almost always meant a place enclosed with walls (the Promptorium has " cloos or yerde, clausura," and yerde is the yard or garden), and so

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* Hoc pratum, a meadowe. Nominale, 15th Cent.
Regina prate, an^{ce} medesewte.
Melissa, an^{ce} medeswote.
Melissa, an^{ce} medeworte. Latin and English, voc., xv. Cent.

† De senectute.

Shakespeare makes Timon say, "I have a tree which grows here in my close," (Timon of Athens, v. 2.) It was also near the house, sometimes in it, and then it was reduced in size, and becomes a closet. As applied to buildings the name still survives in Cathedral close and Vicar's close, and I believe is now confined to Cathedral buildings; as field names we have long close, broad close, and cling close, which if it means anything probably means that it was the field that lay nearest to or joined the house.

Leaze is entirely an old country word. I once thought it might be the plural of lea, a meadow, but in some parts, Oxfordshire for instance, the plural leazon appears, and it is certainly the same as the old A. S. lese, or leswe, a pasture. We have several leazes in Bitton, as east leaze, crooked leaze, middle leaze, cow leaze, bean leaze, little leaze, long leaze, beech leaze, pigeon-house leaze, wheat leaze; these all explain themselves, and Nanny's leaze, Hart's leaze and Bright's leaze are clearly named from former owners; but I cannot explain lark's leaze or pill leaze.

Tyning as a field name is a very curious survival of a very old word, now only known as a field name. It comes from the A.S. *tunen*, to hedge in, and in the old authors it is not restricted to field work. In the Ancren Riwle (13th century) a Nun is advised to "tunen" her eyes against wicked sights, but in the Promptorium (15th century) the word seems strictly confined to hedges. "Tynyd or hedgydde—Septus;" "Tynin or make a tyninge—Sepio;" "Tynynge, drye hedge—Sepes." Originally therefore meaning the hedge itself, it came to mean a hedged-in enclosure, and that meaning only it has retained. We have in Bitton long tyning, lower tyning, upper tyning, Robin's tyning, Bath Road tyning* and wall tyning, and this last is of interest as a case in which the word was not restricted to a hedge proper, but went back to its older meaning of enclosure, however enclosed. It is on the high ground near the station, where stones are abundant and near the surface, and so the owner would naturally enclose with a stone wall, and the field would be a wall tyning.

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* This is a very curious instance of corruption. In an earlier survey it is Bath Way Tyning, but in older deeds it is Blathwayt Tyning.

Barton is the enclosure for holding the ricks, originally chiefly barley ricks—whence its name, beretun, the ton or tun coming from the same word as tyning.* The word is still in common use for a farmyard, but formerly in some cases it stretched further, and a Barton was the manorial farm not let out to tenants but retained in the lord's own hands. This accounts for the name Barton Farm (we have one in Bitton), and near Bristol was the large Royal demesne of Barton Regis, which still remains as the name of the Hundred, though, perhaps, better known as the name of the Poor Law Union. In Bitton the name only occurs otherwise as part of the surroundings of a farmhouse, though in some cases it is sufficiently large to be separately named, as Mow Barton.

Paddock is a word that has much puzzled the etymologists. In its present form it does not appear in English literature till the latter half of the 17th century, and its earlier form was parroc, or pearroc. In that form it is a very old word for an enclosure, almost of any sort. King Alfred speaks of the world as a parrok,† and as parrock it probably lasted till changed into paddock, though very few examples, or none, can be found after the beginning of the 16th century. It is this change that puzzles the etymologists, the change from the double "r" to the double "d," of which no other examples can be found except in the Lancashire use of poddish for porridge. Park is the same word etymologically, but the park was always a large enclosure for keeping game for the lord's hunting, while paddock was a small enclosure, often and generally within a park, for the training of horses, greyhounds, &c. Wherever the name paddock appears as an old field name I should suppose it would mark the near neighbourhood of an ancient house of some importance. We have in the Bitton survey only Greenway's Paddock, Butterwell Paddock and Rusley Paddock, which I suppose to be a corruption of Rushy, but in the Court Rolls of the Manor in 1368 there is also Pat Parrok.

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* Barn comes from the same root. It was originally Bern or Bernes, and Bern=bere-ern, a storehouse for barley.—Ayenbite of Inwyt.—Glossarial Index.

† Thisum lythum parrocce.—King Alfred—trans. of Boethius.

Hayes is another old word for a hedge or enclosure. It forms the first syllable of hawthorn in its other form of hawe, and is well-known in Bath as a place name, East Hayes and Upper Hayes. In Bitton we have only Little and Great Hayes and Dog's Hay, but I believe the name is much more common in other parts of England; there is a whole parish called Hayes in Middlesex.

Now all these generic names that I have mentioned have one feature in common; they all mark enclosures, and so they carry us back to the time when enclosures were the exception and not the rule as they are now. It is not so long ago that by far the greater part of England was unenclosed, and in the parish of Bitton I suppose that less than 200 years ago more than half of the parish was unenclosed, and of that a large part was open forest. I am not aware of a single acre in the parish now unenclosed. Almost during my own life-time, though not during my own incumbency, large tracts at Oldland Common, Longwell's Green, North Common, Hanham Heath and Hanham Green, described as "common and waste lands," were enclosed by the Act of 1819. These contained 190 acres, and at the same time some "open and commonable arable fields" called Westfield and Redfield, of 70 acres, were enclosed, and later still (in 1865) 260 acres of commonable meadow were enclosed. The late Mr. Davidson, of Warmley, who died in 1850, told me that he had conversed with a man who had seen the last stag killed in

Kingswood Forest, so that it is not very long ago when there were special reasons for giving special names to enclosures, marking them as legal (or sometimes, probably, illegal), enclosures from the surrounding open country or forest. We have a good instance of such a country in the neighbouring county of Wilts, where very large farms exist, but where the enclosed parts of the farms are often not more than one-tenth or even one-twentieth of the whole; the rest is all open unenclosed country. In connection with this I would mention that we have several fields still called moor and heath, which, no doubt, mark the site of old open country though now long enclosed. We have Kipsley Moor, Kenn Moor, Waddown Moor, Press Moor, and Aldermoor. We have also Moorcroft which would be a croft adjoining the moor, and I should have mentioned Croft among the generic names, for it is a very old word meaning a little field. It is used in the 14th century by Langland* in Piers Plowman, who also mentions Parrok. But besides Moorcroft we have in Bitton only one other field called the Croft now part of the Vicar's glebe. Besides the moors and the commons previously mentioned we have Wigley Common, and we have Hanham Heath, now called Hanham Common, and Caddy or Cadbury Heath. There is still heather to be gathered on Hanham Common, but Cadbury Heath is built on and cultivated, and the nearest place where I can now find heather is on Siston Common, just over the borders of the Parish, and on the railway banks adjoining it, and these banks are now getting gradually covered not only with heather but also like the neighbouring Rodway Hill with the dwarf gorse, *ulex nanus*, a somewhat uncommon plant, very like the common gorse, but sufficiently distinguished by some slight botanical differences and especially by its low prostrate habit, and by its flowering in the autumn and even in the early winter, instead of in the spring and early summer.

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* Thaune shaltow come by a crofte. v. 582.

Many fields are named from their fruitfulness or unfruitfulness. Of names denoting fruitfulness we have many specially named after crops (of which I will speak further on) but besides them I suppose the Green Ground would be so named from its rich pasture, and perhaps this would account for such names as Eden field, Mount Pleasant, Angels Hill and perhaps Butterwell and Honey Hill. Eden field is a very rich lowland pasture but Mount Pleasant and Angels Hill may be named from their pleasant position and prospects. Unfruitful fields are noted by such names as Shortgrass, Pickpocket, Little Pickpocket, Troublesome, Little Worth, Hungry Hill, Foulwood (a piece of pasture) and Poor Tyning, though the last may have been land in some way belonging to the poor of the parish. To these we may probably add Brier lands, remembering that briers and thorns were the universal symbols of unfruitfulness, and hindrances to cultivation.

Many fields are named after animals. We have Conygre and Congrove, a well-known word spelt in many different ways and meaning a rabbit warren; Brockham Hill, once no doubt famous for brocks, *i.e.* badgers and foxes, which have long ceased to frequent it; Goose-acre a very common name in many parishes, probably once an open common as in the adjoining parish of Siston where it is called Goose Green; Doveley, Larks Leaze, Cowhorn Hill field, the road taking a twist just like a cow's horn, Catscliff and Cockshot Hill and Cock Road both well-known words in all forests marking the places where snares were set in a sort of decoy for the woodcocks.

Many fields also are named from plants, and it is a fair guess that the plants named flourished in such fields. We have Withy Bed, Aldermoor, Cow Cabbage Field, Hop Ground (it must be many years since hops were grown in the parish), Rusham, Elmgrove, Ryedown, Ryelands, Cherry Orchard, Cherry Garden (this also marks a local crop long given up), Poplar piece, Mary Gold ground (a name difficult to explain, for the beautiful corn-marigold is fortunately absent from our fields, and I know of no other plant that would be so named), Bean leaze, the Ashes, Rusley Paddock and Rushmoor, French Grass ground, Short grass, Lime combe, spelt also Lincombe, and so perhaps the same as the Bath Lindcombe and interpreting it, and Holly Guest. I can find no meaning for guest in this name but I suppose it is the same as "gast" or "gist" in Sidgast and Haygast, the names of other fields, and which may take their name from the sedge; or the one may be a sideland piece, and the Holly in the other field may be a corruption of hollow.

The position of fields is shown by such names as Lauthorn Bottom, Sidelands, The Lakes, a piece in the meadows formerly always covered with water in the winter, but now drained, The Island, a piece formed from two channels of the Boyd, of which one is now stopped, and the field is no longer an Island, Holm mead, once literally an island meadow in winter but now drained, the Hams, the well-known name for meadows near a river, and the Cleeves, a steep field or cliff. The nature of the field is shown in such names as the Sands, Dry Ground, Dry Hill, Dry Tyning or Burnt-baked Ground and Stickmore Grove; and the shapes of fields in such names as the Leg (curiously like the map of Italy with the foot turned to the right instead of the left) Pond Leg, three-cornered patch, Hatchet piece, the Harp (another field was called "Le Harpe in Bitton feld" in 5, Henry VIII.), Carpenter's square, and Spectacle acre. This last was a curious piece of land with two circles and a narrow connection which probably owed its shape originally to the course of water, and which I well recollect in Holmead before the meadows were enclosed.

A very large number of fields are named after proper names, but of that I shall say very little, for no names are so subject to change. It was long ago marked as a sign of unwise men that "they think their houses shall continue for ever and they call the lands after their own names," for such names soon pass away, and almost naturally so and without effort. Even if a new owner does not wilfully blot out such remembrances of the former owner as are preserved by his name, his neighbours would soon do so for him; if the field belongs to Mr. Jones, they will not long call it by its old name of Smith's field; they soon call it Jones'.

I now come to names which I must take singly, because they will not fall in under any of the divisions I have named, and I will take first those which I can explain, or at least guess at their meaning.

I suppose former industries are commemorated in Potter's Wood, and the Matmans, who may have made his mats out of the rushes. Chapter's Mead may have been part of the old Prebendal property, but is more probably a surname. Tump Tyning may mark some large mound or clump of trees, as Barrow Hill takes its name from the Barrow that stands in its centre. Normead is the North Meadow, and Lynch and Grass Lynch must mark fields that formed the boundary to something or other. Claypit Acre has no claypits and apparently never had, and is of ten acres, and this is a matter of some interest. Acre is simply the old English form of the Latin *ager* and the Greek *'αγρος*,* and was originally of any extent, and it was not till the reign of Edward I. that its size was fixed at four roods of forty poles each. It was even a measure of length, and this loose way of speaking of it has survived in our field names, many of which are called simply acre, as long acre, middle acre, etc. The best survival is in that good name for a churchyard, "God's Acre," which may be less than a quarter of an acre or may be nearly two acres as at Bitton. With this we may join furlong as a field name (we have or had a Long furlong at Bitton), the furlong being now a fixed measure of length, but originally a furrows length, *i.e.*, the amount that could be ploughed within a given time.†

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* The old plant-name Staves-acre is the Anglicised form of Staphisagria, which again is the Latin form of ἀσταφις 'αγρια

† The old term a "yard of land" looks as if it might be connected with acre and furlong; but in this case the "yard" has no connection with the measure; it is the word used in vineyard, orchard, etc., the garth and garden, *i.e.*, an enclosure.

We have one field called Coffin Tyning, and "Deadman's Fields" and other similar names are not uncommon in other parts of the country. I believe such names always point to some old (probably forgotten) struggle which ended in death. Slaughter and Slaughterford would have the same meaning. There are even Death's Fields, but these are almost certainly derived from the old family name of De Aith, now corrupted into Death. At Sarsden, in Oxfordshire,* there are fields called Qualmstones; they are marked by a large stone to which a legend is attached of a sheep-stealer being strangled by the stone catching in the rope on which the sheep was slung and so strangling him. I have little doubt that the legend was a late invention when the old meaning was forgotten. Qualm is the old English word for death or pestilence, and there are throughout England many such large stones, to which in times of pestilence provisions were brought to the infected districts, and the money placed on the stone, and so all contact was avoided. The case of Eyam, in Derbyshire, is well-known, and there is one at Stoke Bishop, near Bristol, still called Pitch and Pay, and I have no doubt the Sarsden Qualmstones are the same.

To return to Bitton—Baglands and Little Baglands, Heards, Soper's Pool, and Chedwin House are probably proper names and may be passed by. The Lons is a good old word, apparently a local form of Launde, of which Lawn is the modern variant. We now always connect lawns with a well-kept garden, but the Lons, or Laund, were very different. They were always open grassy spaces in a forest, what we should now call grassy glades. And so I suppose that any field called the Lons (we have three or four in Bitton) would mark the neighbourhood of old woods or forests; just as Lansdown, formerly Launtesdon, was the western boundary of the old Royal Forest of Furches; and with its wide sweep of grass, edged on its steep inclines with woods of which many still remain, it would well represent an ancient lawnde or Lons.

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* For this information and for the account of the fields at Wickwar I have to thank J. Harell, Esq., of Falfield.

One field is called the Girt which I cannot explain, but it is a curiously formed field and I have no doubt the name in some way, perhaps corrupted, is derived from the peculiarity. The field is a steep field and near the top is a curious little valley converted into an orchard, evidently of water-formation, and is a small combe except that it is at the top instead of at the bottom of the hill.*

There are two fields called Pilgrim's Pye and Fieldgrove Pye, of which the last word is a puzzle, and so is the last word of Barn Show, which may, however, be Barn Shaugh, or Barnwood. And there are some fields called Kimmercombe, Cammercombe, or Kimbercombe, of which I suppose the first part to be a proper name, but, as the land is high ground, the "combe" does not seem appropriate. We know that Kingswood is Sylva Regis, but Kingsfield I suppose to be from a proper name and not connected with Royalty.

I must lump together a few of which I can offer no explanation; as Trap's Stile, Veltam or Neltam, Pond Leg or Pound Leg, The Draft, Innox, Neddy Mayle or Myle Ground, Roborrow, Hencliff,† Lye Ash, Mole House Ground, The Penns, Logus or Laggage, The Breaches, Blowbottle Patch, Rhymus, and Varn Shoard.

With respect to the age of these names, I think very few of our present field names are very old; I mean they are not in any sense mediæval. This would naturally be the case from what I said before about the modern date of enclosures generally. There are no old field names in Domesday, I believe; certainly not in

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* It has been suggested to me that girt is simply the local pronunciation of *great*. I cannot quite agree to that.

† Formerly Hancliffe.

Gloucestershire, unless we count such names as meadow and vineyard.* But as enclosures became more frequent, names were a necessity. We have the Court Rolls of the manors of the parish dating from A.D. 1368, till the reign of Elizabeth and later, and in them a few names occur, such as Newclose, Holemed, Monkecroft, Longebene, Shortebene, Mondeysland, Denhulle, Pat Parrok, Wodecroft, Bondelench, Lemys, Myccalmede, Mores, Redfield, Durneville, Le Moses, Le Mooiet, Bull Hawes, Henze Mede, Barney Hey, Lanes Haye, Hurdman's Croft, Great and Little Holke, Long Furlong, Beche Lawe, Syddgast, Hancliff, Haygast, Connigar, Gascon. A few of these still remain, and a few may be traced corrupted to their present shape, but this is a very small quantity compared with the present abundance of names.

This process of naming of course still goes on, and so does the corruption. As owners change, and fields are divided or thrown together, the old names lose their meaning and are abolished. And some of the changes and corruptions are past explanation. Near the Village of Bitton is a large hilly field now always called Major's Hill after a former owner, Major Ryners, but the curious thing is that the name was not given till at least forty years after the Major's death; before that it was simply the Hill. Then between Bitton and the Station is a farm, which in a wonderful way has got the name of Knight's Folly Farm. No one can explain the name, or how it got there; there never was an owner of the name of Knight, and I am not aware of any special folly attaching to the farm, except that the Ordnance Surveyor put the name on their maps without any authority. I am afraid these surveyors will have to account for perpetuating a large number of mistakes all over the kingdom. They are too ready to accept any information from any informant. I mention these as instances of names springing up almost of themselves. As an excellent instance of corruption I will give you one not from Bath but from the neighbouring Parish of Wickwar.* In a survey of 1772 there are two fields one called King Poleham's and the other Wheelers, both probably surnames; but in the 1840 Tithe Award they appear as the King of Poland's Ground and the Queen of Poland's Ground.

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* On this point I have been able to consult the Rev. C. T. Taylor, of St. Thomas', Bristol, who is well acquainted with old English charters. He confirms what I say about Domesday, but he gives me a few instances of possible field names before the Conquest from the "Land Charters" (Earle). They are, however, very doubtful. But on a grant from Cynewalf, King of the West Saxons, to his Earl Bica, of land of Bedwin, A.D. 778, there is an undoubted field name, "Agellum qui dicitur tatanesdisc" = Tate's Enclosure. Sweet's "Oldest English Texts," p. 427—In an exchange of land between St. Mary, of Salisbury, and St. Augustine's, of Bristol, St. Mary gave "quatuor acras" . . . videlicet unam quœ dicitur "Esse acre," et . . . dimidiam acram in "Rug Furlong."—Register of St. Osmund—Rolls Series I., 264.

But I must draw to a conclusion. I hope I may have shown you that even such a commonplace thing as a field-name may be of interest, and may help in working out our parochial histories, and though my paper has exceeded the usual limit, I can assure you that I have had to curtail a great deal which I could have added, but I should certainly have wearied you. As it is, I feel that I must apologise for the length of my paper; but I do not apologise for the commonplace character of the subject, for it is surely well within the work of a Field Club to talk of fields and their names.

P.S.—Since writing this I have received from Lord Moreton a long list of field names in the Parishes of Sarsden and Churchill in Oxfordshire. It is a very interesting list and proves what I have said, that every parish can show its own peculiar names. After deducting those of which I have already spoken in Bitton, and many which are clearly proper names, there still remain many which I should like to add as a postcript, but without note or comment. They are :—The Pick, Crahecomb, Bedlam, Trethill, Burhill, Mayswell, Qualmstone Piece, The Yanthills, Varndel, Swan's Nest, Grey Goose Leys, Leapyatt, Swine Mead, Lot Mead, Rinehill, Hensdon, Town Butts, Norrill, Sturt, Spout Close, Hollow Back, Lyneham, Cordial Well, Turfield, Handkerchief, Long Furlong, Hencroft, Finescroft, Bedlam Close, Pinkwell, Cuckoo Pen, The Bratch, Costard Hill, Greensward, Glyme Hill, Catsham Mead, Standale Pits Furlong, Muzzard, The Garlick Ground, Trooping Stone Field, Barnhill, Bluegate Ground, The Water Shower, Abbott's Gallows, The Digging Field, Leopard Close, Short Basil, Cat's Brain.

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* Inform., J. Harell, Esq.

The Visits to Bath of two Queens; Anne Consort of James I.; and Anne, Queen Regnant. *By* EMANUEL GREEN, F.S.A.

(Read, January 13th, 1892.)

Two Queens named Anne have visited Bath, each of them more than once. As these visits are either only slightly on record or entirely unknown, confusion may arise, or perhaps has arisen regarding them.

The first in order of time was Anne, consort of James I., who had determined on a visit in 1612. This was deferred, however, in part perhaps from domestic trouble, for in this year died Prince Henry the heir apparent. In the following year 1613 the plan was carried out Leaving Windsor on the 26th of April the Queen arrived at Cawsham (Caversham), the house of Lord Knollys, where she was entertained with revels and a mask, a form of reception always interesting and quaint. An account of the proceedings was printed in a small quarto pamphlet entitled :—

A Relation of the late Royall Entertainment given by the Right Honourable the Lord Knowles at Cawsome House neere Redding, to our most Gracious Queene, Queene Anne, in her Progresse towards the Bathe, upon the seven and eight and twentie dayes of Aprill 1613.

First on entering the grounds she was received by some "wild men;" then passing on through the gardens she was met by a gardener who addressing her as, most magnificent and peerless deity, loe I the surveyor of Lady Flora's workes welcome your grace with fragrant phrases into her bowers," &c., &c., then turning to some musicians, he ordered them, "Come, sirs, prune your pipes and tune your strings, and agree together like birds of a feather." A song followed, the voices being a treble and a bass;

Welcome to this flowrie place
Fairie Goddess and sole Queene of grace
  All eyes triumph in your sight
Which through all this emptie space
  Casts such glorious beams of light.

Paradise were meeter farre
To entertaine so bright a starre.
  But; why erres my folly so?
Paradise is where you are
  Heaven above and heaven below.

From Caversham the Queen passed on by Littlecot, Abury, and Laycock to Bath. She had been preceded as usual by a Gentleman Usher Daily Waiter, who charged as for himself, for one Yeoman Usher, two Yeomen of the Chamber, two Grooms of the Chamber, two Grooms of the Wardrobe, and one Groom Porter, making ready divers houses between London and Bath, thirty days, in April and May, £26 10s., and for sundry alterations about Her Majesties lodgings at Bathe, and making ready the church at divers times, and the King and Queen's bath, twenty days, £17 13s. 4d.* At the time of starting the Queen "took account" to stay at Bath not more than ten days, yet the journey, it was thought, would cost her £30,000.* Notwithstanding this, and that the journey was made in great state, notices or entries relating to it are curiously absent, the only record apparently being a warrant by Privy Seal to the Gentleman Usher of "our dearest wife" for payment of £220 for divers necessary charges expended for her use at Bath.† Bath histories too are entirely silent. Leaving Bath on Friday, 4th June, the Queen duly arrived in Bristol, the preparations there costing £15 18s.‡ An account of this visit comes to us in a pamphlet entitled :—

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* Accounts, Treasurer of Chamber, fol. 8 dors.

> A Relation of the Royall, Magnificent and Sumptuous Entertainment, given to the High and Mighty Princesse, Queen Anne, at the renowned Citie of Bristoll by the Mayor, Sheriffes, and Aldermen thereof, in the month of June last past, 1613. Together with the Orations, Gifts, Triumphes, Water Combats, and other Showes there made.

Herein we are told :—

The grave and ancient Counsell first, in gownes of scarlet dye,
Attended on, each by a page, did ride triumphantly,
The bels most joyfully did ring with musicks symphony,
And still these words, God save our Queene, re-echoed in the skie.

In the water combat, supposed to represent a naval fight between Christians and Turks, six bladders of blood were poured out of the "scubber" holes to make the thing look real. From Bristol the route homeward was to Mr. Henry Billingsley's, Siston House in Gloucestershire, then round by Bishop's Cannings, Tottenham, Newbury and Reading, to Windsor, and then to Greenwich.§ At Bishop's Cannings, on the 11th June, the Vicar, George Ferrebe, having composed a song for four voices and trained some youths to sing their parts, dressing himself as a bard and clothing

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[*] S. P. Dom., vol. 72, 120

[†] Sign Manual, vol. 3, No. 12. S. P. Dom., vol. 74, p. 189.

[‡] Pipe Office, Treasurer of Chamber, Series i., Box G. Ticket 4, fol. 9.

[§] S. P. Dom., vol. 74, 10

his singers as shepherds, met the Queen at Wansdyke, where the song was sung, and a "lesson" by the same composer was played on wind instruments. According to the Stationers' books the song was published as: The Shepherds Songe before Queen Anne, in four parts complete musical upon the Playnes of Salisbury. The Queen was greatly delighted at this episode, and the Vicar was made Chaplain to the King.[*] Generally, too, the Queen received such great entertainment and was so well pleased with what was done for her, it was soon understood she would make more such progresses.[†]

The satisfaction thus expressed was evidently real for on the 27th July, little more than a month after her return, she prepared to repeat the visit. The King preceded her somewhat but did not forget her, as by Privy Seal he ordered the Treasurer to pay the Gentleman Usher of his dearest wife £200, she being purposed to go to the Bath this Fall to use the benefit of the waters, and so may have occasion of divers extraordinary expences either for rewards or other services.[‡] The King, starting alone, went first to Tottenham and then by Lydyard, Bromham, Amesbury, and Wilton to Salisbury, where he arrived on the 3rd August. The Queen took another route, going by Oatlands, Elverton (Elvetham), Basing, Husband (Hurstbourne), dined at Wallop and then to Salisbury, Mr. Hyde's house and the Dean's house being prepared for her.[§] At Salisbury she joined the King.[||] Charges were duly entered for making ready the church for the King and Queen four times; the Bishop's house for the feast on the 5th August; and standings twice for the King and Queen to see the football play.[¶] On the 9th a trip was made to Cranborne, returning to Salisbury on the 11th. The return to Salisbury was a disappointment, as this departure seemed to promise the discovery of an unknown route through Somerset passing probably by or near Cadbury Camp where there is a spring called Queen Anne's well, a name difficult to account for except for such a reason. On the 13th the King left for Bewlye, a favourite spot, where he stayed a week and then returned to Windsor, by Broadlands, Titchborne, Farnham, and Bagshot. The Queen went her own way in an opposite direction, first to Fountain (Fonthill), where she dined, and then to Longleat, having been preceded by a Gentleman Usher and his subordinates, who had "by the space of ten days" prepared for her at a cost of £8 16s. 8d.* This was a favourite resting place, and royalty seemed always welcome. In March a Gentleman Usher, with his grooms, charged for riding from London to Sir Thomas Thynne's house at Longleat to attend and make ready for the christening of his son. No royal visit is chronicled for this date, so that this was probably done by proxy. The Queen's daily movements are ot recorded in a consecutive form, nor are they regularly dated on the parchment rolls, consequently one fixed day or date must guide for others. Presumably she left Salisbury the same day as the King, the 13th August, and so arrived on that day at Longleat. Next day, Saturday the 14th, she went on to Wells.

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[*] Wood, Athenæ., vol. 1.
[†] S. P. Dom., vol. 74.
[‡] Sign Manual, vol. 3, No. 54.
[§] Declared accounts, Treasurer of the Chamber, fols. 8, 9.
[||] Exchequer, Q.R., Miscellaneous. Household, $\frac{82}{5}$ fol. 25.
[¶] Pipe Office, Declared accounts, No. 544, fol. 10.

The route to be followed on these Progresses was necessarily planned and known before starting; thus her intention of visiting Wells was known there on the 19th July when the Mayor and Masters in meeting assembled determined on what should be done at her reception.†

The minutes in the Corporation book read—"Forasmuche as by a l're sent from the Lord Buishoppe it appeareth that the Queene's Maj'tie doth intend to come to Welles, and therefore it is desired by his Lords'pp that there should be a silver Bole given to her Maj'tie of the price of xxl.; that the streetes should be made handsome, and the towne to be ridd of beggers and rogues.

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* Pipe Office, No. 544, fol. 9, fol. 10 dors.

† Wells Corporation Records, Convocation Books, fol. 37

"It is therefore now ordered, that there shal be a Bole p'vided of silver and guilt of the price of xxl. to be given to her Maj'tie.

"It is also ordered that the streetes within the Towne shal be pitched where need is, and especially in Sadler street; and for the more better effecting hereof it is likewise ordered that the pitchers shall, with the supervisors of the highwaies, take upp a a stone before every man's doore where it is needed to be pitched.

"It is alsoe ordered, that the conduite shal be colored, and laid with oyle, which is referred to the considerac'on of Mr. Mayor."

In Convocation held 22nd July, it was ordered,* "for the entertainement of the Queene's Maj'tie that the Mayor and his brethren shall attend in their scarlet gownes neere aboute Browne's Gate and the residue of the xxiiii to attend likewise in p'son in blacke gownes, and the residue of the Burgesses to attend likewise in their gownes and best apparrell; and this to be done by the oversight of Mr. Mayor, Mr. Baron, and Mr. Smyth."

At the same time Mr. Coward, Mr. Tabor, Henrie Foster, and Will'm Atwell, were appointed a committee "for the overseeinge of the armed men; and for the overseeinge and direction of the Shewes to bee made before her Maj'tie, Mr. Southworth, Mr. Godwyn, and Mr. Coward; and they to give allowance for the matter of the Shewes, whether they be fit or not, and every Companie to bee contributorie, as they have binne in tymes past, to the Shewes aforesaid."

All preparations being thus made and the Queen being at the Bishop's, at another Convocation held 16th August, it was ordered and agreed "that every severall Companie within this towne shall make themselves readie accordinge to the auncient orders and customes to shew themselves before the Queene's Matie. And that every Companie and every severall man within the Companie shall contribute such somme and sommes of money towarde the said shewes as shall bee agreed uppon amongest themselves or in defalt of such agreement by them, then by the greater parte of the xxiiii^{tie} uppon paine of imprisonment and there to lie till such severall rate bee payd and satisfied."* The eventful day arrived and the same books record :—"The order and manner of the Shewes by the Masters and Wardens of every trade and occupac'n within the Cittie and Boroughe of Welles, as it was presented before the Queene's Maj'tie in Welles, uppon Fridaie the xx daie of Auguste Anno D'ni. 1613 :—

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* Fol. 375.

"The first Company—

"The Hammer men, which were the Carpenters, Joyners, Cowpers, Mazons, Tylers and Blackesmethes, and they presented a streamer with their armes; and Noah buildinge the Arke; Vulcan workinge at the forge; Venus carried in a charriot, and Cupid sittinge in her lapp with his bow bent; a morrice dance; the Dragon which devoured the Virgins.

"The second Company—

"The Shermen and Tuckers, and they presented a streamer with their armes.

"The third Company—

"The Tanners, Chaundlers, and Butchers, and they presented a carte of old virgins, the carte covered with hides and hornes, and the virgins with their attires made of cowtayles, and bracelettes for their neckes of hornes sawed and hanged about their neckes for rich jewelles. Their charriot was drawne by men and boyes in oxe skinnes, calves skins, and other skins.

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* Fol. 377.

"St. Clement their St. rode allsoe with his booke, and his Frier rode alsoe, who dealt his almes out of his Mrs's. bagge (which hee carried verie full of graynes) verie plentifullie.

"Acteon with his huntsmen.

"The fouerth Company—

"The Cordyners, who presented St. Crispian and " (a blank here, perhaps for Crispianus) "both of them sonnes to a Kinge and the youngest a shoemaker, who married his master's daughter. They allsoe presented a morrice daunce, and a streamer with their armes.

"The fifth Company—

"The Taylors, who presented a streamer. Herod and Herodias and the daughter of Herodias who daunced for St. John Baptiste's hedd. St. John Baptiste beheaded.

"The sixth Company—

"The Mercers, who presented a streamer. A morrice daunce of younge children. The giant and the giantesse; Kinge Ptolomeus with his Queene and daughter which was to be devoured of the Dragon; St. George with his Knightes who slew the Dragon and rescued the virgin; Diana and her Nymphes carried in a charriott, who turned Acteon to a Harte.

"Memorand, allsoe, that the same day were invited to dynne with Mr. William Bull then Mayor of Welles, the Right Hon. the Earle of Worcester, the Earle of Tinmouth, the Lord Bushoppe of Bath and Welles, Sr. Thomas Somerset, the Comtesse of Darbie, the Lady Cary, the Lady Gray, the Lady Winzor, the Lady Hatton, the Lady Walsingham, the fower Maydes of Honor, with other p'sons, which came accordingly, except the Earle of Worcester.*

The charges of her Gentlemen Ushers here were, for making ready the Cathedral Church at Wells for a sermon which her Matie heard there, four days, in August, £3 10s. 8d. Making ready the Lord Bishop's house at Wells, twelve days, £10 12s. For making ready roomes and standinges appointed fyve severall tymes at Welles for beholdinge of Pageantes, showes and sportes presented to her Matie, eight days in August, £7 16s. From these charges it appears that besides the grand show of the 20th, the last day of the visit, there were other pageants and sports altogether "fyve several tymes," which would be on Monday, Tuesday, Wednesday, Thursday and Friday, the 16th, 17th, 18th, 19th and 20th August. There was also the sermon presumably on Sunday the 15th, the day after arrival.

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* Fol. 376.

Before passing on, the final record of the visit may be noticed. On the 4th March, 1614, it was ordered ; "that whereas there have been diverse charges laid out by diverse Companyes of this towne concerninge the shewes presented before the Queene's Matie at her late beinge here : whereof there be diverse somes yet remayninge unpaid ; first that there shalbe a generall callinge of every Company to geve notice what theire charge have been and how it have been taxed. And if uppon consideration had it shall then seeme fit that the Companies have over charged and cannot well noe more , then there shalbe a contribucon made out of the common livehode as it shall then seeme fit in the discretion of the Mayor, masters, and Burgesses or Companies." Having thus provided for money matters it only remained to dispose of the materials used and so, finally, it was ordered : "that such thinges which the Commonaltie shall pay for to (be) brought into this house and laid up untill such tyme as farther occasion shalbe used for the same."*

On Saturday, 21st August the Queen's journey was continued to Bath. Most unfortunately, there is no record of the route taken from Longleat to Wells, just the few miles of the greatest interest, so here again, just where so much wanted, there is no record of the route taken to Bath; no mention as is usually the case of a dining house prepared, no hint or word of any kind to guide or suggest in any way. The ushers preceded as usual and made ready Dr. Stewarde's house and Mr. Hadnette's house at the Bath, being occupied twenty days in August and September for which they charged £17 13s. 4d. For making ready the baths ten several times, ten days in August and September, £8 16s. 8d. For making ready her Majesty's bathing chamber and the church five several times, with alterations in her lodgings, ten days in September, £8 16s. 8d.

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* Fol. 385.

Dr. Thomas Mayerne the King's physician, in a letter written in French, dated "Aux baings" 31 August, in giving the King an account of the Queen says she had that day bathed and on leaving the bath was in the best of spirits. Work thus well commenced, wrote the Dr., is half finished, and that which advances it most, that which touches the health, is the firm belief the Queen has in the process. Tout va bien jusques à cette heure. The King too seems to have been out of sorts being worried with a painful colic, much troubled with "a flux and griping of the belly" so the Doctor enclosed a list of the medicines which he thought good. Of these he recommended the most bitter, combined with a regulated diet, "without which failure will result."* The list of medicines is not now with the letter. The Queen's stay at Bath was short. Leaving in September she passed by Laycock, Broadhinton, Littlecot and Newbury, and so to Windsor. A reference to the account for "apothecaries stuff and other parcels provided for the Queen's use" about and at this time will show how she was treated. The accounts are returned quarterly; thus taking first, for the sake of comparison, the ordinary quarter without special illness, ending 25 Dec., 1612, the cost was £60 6s. 6d. In February, 1613, letters record that she was indisposed, the consequence that in the quarter ending 25th March, 1613, the charge rose to £74 17s. On the 20 April she went to Bath, and then for the quarter ending at Midsummer we have £83 18s. Then came the second visit to Bath and for the quarter ending 29 September a modest consumption amounting to £92 9s. 6d., or at the rate per annum of a pound a day.* Yet she survived a little while, but remaining always in weak health. After passing by one year, it was determined in the summer of 1615 again to try the Bath.

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* S. P. Dom., vol. 77, No. 55.

In a short account within a limited space, it is hardly possible to attempt a picture of the rumbling coach, the often bad roads, the slow progress, the many attendants and their followers, making up the cavalcade on these occasions. As too all had to be provided for, their coming and passage by was not particularly liked. This journey of the Queen and that of the King for this year being known, a letter of 20 July, 1615, says, "this comes ill to "those countries they are to go through, who made petition to be "spared this year in respect of the hard winter and hitherto "extreme hot and dry summer, whereby cattle are exceeding poor "and like to perish every where."† Money too was short in the Treasury the receipts for the half year being assigned in advance, so that the Queen's journey originally planned for March was postponed until cash could be found, it being arranged that she should be "first served."‡ She was thought now to be in danger of dropsy.

Towards the end of July the Queen started, first stopping at Colbrook, only five miles from Windsor where lodgings had been prepared; next at the Bear Inn, Reading, then to Newbury, then the Earl of Hertford's at Tottenham prepared after ten days attention at the usual cost of £8 16s. 8d. A departure was here made from the direct route, for what must have been a pleasant ride across the turf of the plain to Salisbury, a dining house having been prepared at Everley. For waiting and attending and making ready the lodgings at Salisbury, with the church, and the bishop's palace for dinner and supper, twenty days in July cost £17 13s. 4d. Probably there was some intention of meeting the King here, as he came to Salisbury from his favourite haunt, the New Forest, for the feast of the 5th August, and dined at Wilton. The Queen however left before his arrival proceeding by Chiture (Chittern) where she dined, and so to Bath. She was preceded as usual by ushers, grooms of the chamber, yeomen, and groom porters, who charged, for making ready at Dr. Stewarde's house at the Bathe by the space of twenty days; the church there by the space of eight days; her Majesty's bathinge lodgings at Mr. Hadnethe's house; the Queen's slip in the bath, and divers alterations about her Majesty's lodgings by the space of ten days, in all thirty-eight days in July and August, £33 11s. 4d.* There were further paid £105 10s. 9d., besides another sum of £400, money disbursed in fitting and providing of lodgings at Bath these two journeys in 1615.† Under date of this year, 1615, Warner, p. 320, tells us that a light appeared in the King's bath when the Queen was bathing causing a fright, and a consequent making of a new bath known as the Queen's bath. He gives no authority for the story, and as nothing has hitherto been known of this visit, and consequently Warner knew nothing of it, his date may be supposed a misprint for 1613, a visit in that year being known through the Bristol histories, as already noted. No one probably will accept this story of the light, one light once appearing specially to a queen; so also the story of the consequent new bath with a new name in 1615 must be examined, inasmuch as the name already existed in 1613 when there is a distinct charge for preparing the King and Queen's bath. Certainly the word bath here being in the singular may possibly mean but one bath with a double name; but there were also the Queen's bathing chamber and bathing slip, implying if there were only one bath, some division, or separation sufficient to make one part known as the Queen's bath.

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* Treasurer of Chamber, fol. 6.

† S. P. Dom., vol. 81, p. 17.

‡ S. P. Dom., fol. 80, p. 38.

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* Treasurer of the Chamber; Bundle 390, Roll 52.

† Pell Records, 23 Dec.

At the end of August the Queen left Bath now going by Philips Norton, where she dined at Mr. Flower's house, prepared after three days at a cost of £2 13s.*; then by Warminster, Rowde, Marlboro, Newbury and Reading to Windsor in September. The apothocaries stuff from 25th March to 24th June cost £81 16s.; from 24th June to 29th September, £87 8s. 6d. Just before she left, in one of the often squabbles of this time, one Jonathan Piggott was slain by Lord Norris, who through the right breast of the said J. P. ran his sword, in the place called the Litten in the parish of Stalls. John Cutts was Mayor; the verdict manslaughter.†

This visit did the Queen no good; she returned not so well as when she left.‡ Notices of her continued illness are found frequently. In January 1617 she was "sick of the gout." In October she was "indisposed," the doctors feared "an ill habit of "body." In January, 1618, she was in a languishing condition, with swelling of the legs. In March, 1619, she died.

The Queen whose movements have thus been traced was Anne daughter of Frederick, King of Denmark, and consequently known as Anne of Denmark.

As time passed on another lady, Anne, daughter of our own King James II., married Prince George of Denmark, and so also became known as Anne of Denmark; thus, if dates be not carefully noted, leading to confusion, especially as she afterwards also became Queen. As Princess Anne she was in Bath in 1688, her visit being fairly well known; and, as noted by Warner, she was there again in 1692. In 1702 she succeeded to the Crown and her first excursion as Queen was to her old quarters at Bath. This visit is not unknown, although not recorded in local histories, but to make this narrative complete, it must be just touched upon. Now at last, like Bristol in earlier days, the visit and reception are recorded in pamphlet form .—

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* Pipe Office, No. 544, fol. 43.

† S.P. Dom., vol. 81—82.

‡ S.P. Dom., vol. 81—99.

The famous Progress, or Her Majesty's Royal Journey to the Bath and happy return. With the most remarkable particulars of her royal entertainment at Oxford and glorious, triumphant reception at Bath and all other places going and coming thence ; her liberal bounty to the poor and touching many of the Evil; as also how 200 virgins clothed in white met the Queen with bows and arrows by their sides , with the numbers of shepherds that met her Majesty in her return with their croks and tarboxes, singing and playing on pipes of reeds, &c. ; as also a great number of spinners with their country wheels dancing and singing by her Majesty's coach and how the Queen was graciously pleased to reward them with her charitable bounty. To which is added several ingenious poems and verses spoken to her Majesty at Oxford, &c., by persons of great quality with her Majesty's gracious speech to the University.

All this title for eight small pages of letterpress. Generally then, coming from Oxford on the 27th to Cirencester, where she slept, and next day by Badminton, where she dined, the Queen arrived at Bath about eight o'clock in the evening of Friday 28th August. On Lansdown she was met by Samuel Rodbert, Esq., the sheriff of Somerset, with a splendid train, and so descended to Hide Park within half a mile of the city. Hide or Hyde Park was "the first place appropriated for taking the air and exercise "in coaches or on horseback," and was "a small ring in imitation "of the ring in Hyde Park near London." It was "six hundred yards in circumference, almost upon a level, upon a gravelly soil, highly situated, defended from the winds," and was "part of the Town Common."* Here she was met by a great number of citizens clad as Grenadiers, and by two hundred virgins divided into two companies, all richly attired, many as amazons with bows and arrows, others with gilt sceptres and the ensigns of the regalia in their hands. Accompanied also by a set of dancers who danced by the side of the coach, the Queen reached the West Gate. Here, with the newly elected members for the city, Alexander Popham and William Blathwayt, Esqrs., she was met by the Mayor and Corporation in their "formalities," the Mayor and the eldest Justice bearing the maces. The Mayor made a loyal speech of welcome amidst the greatest joy, and then, still accompanied by the Sheriff and the maids and the city music, all the streets illuminated and flambeaux carried before and on each side of the coach, the Queen was conducted to her lodgings, which had been prepared for her at the Abbey House. The Mayor and Corporation had the honour of kissing hands and retired, the bells ringing in all the churches, nothing being heard but shouts of "Long live Queen Anne," the streets being filled not only by the inhabitants but by the country people who had crowded in to see the show. The next day the Mayor and Corporation waited on His Royal Highness, Prince George of Denmark.

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* Wood's Hist. of Bath, pp. 439, 440.

After the usual delay and affected mystery of preparation, the Queen began to drink the waters on the 5th September, and so with bathing, drinking, and church going, time passed away.

The monthly expenses so far as they came under certain heads are recorded. From 26th to 31st August the expenses for victual and other things in the journey to Bath, were :—

Dispensa	£8	11	5
Buttillaria et Cellaria	56	17	3½
Gardroba	651	15	5¼
Coquina	43	18	2½
Pulletria	35	17	3½
Salsaria	2	5	2¼
Scuttillaria	16	4	7
Aula et Camera	3	7	10
	£818	17	3

Expenses at Bath in September—

Dispensa	£12	0	4
Buttillaria et Cellaria	93	10	0
Gardroba	732	0	10½¼
Coquina	43	14	7
Pulletria	50	3	1¼
Scuttillaria	9	15	0
	£941	3	6

Expenses at and journey from Bath in October—

Dispensa	£19	3	6
Buttillaria et Cellaria	71	12	4
Gardroba	772	7	6½¼
Coquina	41	2	4½
Pulletria	34	3	5½¼
Salsaria	62	10	3 ¼
Scuttillaria	11	1	5
Aula et Camera	4	13	1
	*£1,016	14	5¼

There is a further charge for money laid out for lodging two of her Majesty's Maids of Honour £106 5s. 6d. For Dr. Younger's lodging £6.

The spicemaker also received payment for money disbursed by him, for rooms where tables were kept for the Queen's servants: for a room for the wardrobe and a room for the Foot Guards.

Also an attendant at the Council Chamber was paid for forty-eight days at 10s. per day.

Two pages of the removing wardrobe, sixty-one days travelling charges in carrying goods to the Bath and for attending her Majesty there, at 2/6 per day each.

Money disbursed by order of the Queen £307 1s. 10d.

Expenses extraordinary in the stables £392 11s. 5d.

A physician ... at 15/- per day.

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* Excheqr. Q.R. Miscell. Household, $\frac{86}{2}$.

A surgeon ... „ 7/6 „
An apothecary „ 7/6 „
Two gentlemen ushers daily waiters 10/- each.
A cup bearer 10/-
A gentleman usher of the Privy Chamber 10/-
A Sewer in Ordinary 10/-
Two grooms of the Great Chamber, each 10/-
Two carvers in ordinary, each 10/-
A corporal of the Yeoman of the Guard 10/-
A groom of the Privy Chamber in Ordinary 4/-
A Quarter Waiter 4/-
Two Yeomen Hangers 3/-
Three pages of the Presence, each 2/6

During this stay there was a daily post from London, as the business of the Court could not be neglected. On the 6th of September from, Our Court at Bath, was issued a Proclamation proroguing Parliament from the 8th to the 20th October; on the 7th September dated from The Court at Bath, a commission was granted in the third troop of Life Guards; and on the 25th the Envoy Extraordinary from Bavaria took his leave of the Queen and afterwards of His Royal Highness.† Longleat, where the knighthood of former days had now blossomed into a peerage, was again on the look-out. Under date 30th August Lord Weymouth wrote, Her Majesty came well to Bath on Friday. It is thought impossible for her to come here in short days and by long bad roads.‡ During the stay the Corporation waited on Her Majesty to church in their "formalities."

After a stay of six weeks, being well pleased with their reception and that the waters had so much benefited the Queen's health, on Thursday 8th October, the royal couple left Bath about nine o'clock a.m., the Mayor and Corporation attending to the North

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* Pipe Office Declared Accounts, Treasurer of the Chambe No. 407, 140. † S.P. Dom., vol. 79. *London Gazette.*

‡ Hist. MSS. 10 Rept., Pt. 4, p. 337.

Gate, where they presented a silver cup with cover and a salver all in a rich case of crimson velvet laid with gold,* and the Mayor in most solemn manner on behalf of the city wished the Queen a happy journey. Outside the city gate the Sheriff and his men were waiting and conducted the cavalcade to the confines of the county. All being gone, the Mayor invited the Corporation to his house, where they drank cheerfully her Majesty's and the Prince's healths.

The route taken was by Marlborough, where the party was splendidly received; the scholars of the Free School recited some verses and the Town Clerk delivered a long speech. As the Queen passed she was met by a great number of shepherds with their crooks and tar boxes, playing upon pipes and reeds; also a company of spinners with their wheels appeared, and all tasted liberally of her Majesty's bounty. So Windsor was safely reached. The journey seems to have attracted more than usual attention, as on the 13th, at Kensington, the Lord Mayor and Court of Aldermen waited on her Majesty to congratulate her on her arrival from Bath, and invited her to a banquet in the city, which she accepted.

The next visit to be noticed is entirely unknown. In the following year 1703, the Queen determined to repeat her trip and this being decided, before starting a special survey was made of the roads, the report being that they were so bad no passage could be made, and suggesting an indictment.† On the 18th August accompanied by her husband the Queen set out. The daily movements are not now detailed on the rolls as of old; but the roads must have been repaired as the travelling seems to have been much faster. Reading and other usual stopping places were passed, the first night being now spent at the Duke of Somerset's near Marlborough; and next day, Thursday, the 19th, after dining at Laycock, Bath was reached about seven in the evening. On

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* *Gazette.* † S.P. Dom., 1703.

Lansdown (in error Kingsdown) twenty chairmen sent by the city were in waiting with sedans to carry the Queen down should she wish it. She however preferred to remain in her coach and so reached the North Gate where she was met by the Corporation with the maces carried by two J.P.'s, the Mayor being unwell. The maces and the keys of the city were duly presented and as duly returned.* Preceded by the Train bands, a company of grenadiers, and the town music; the bells ringing, the streets, galleries and windows, adorned and filled with a vast number of people, her Majesty was conducted to her lodgings at Dr. Peirce's. Of her doings whilst there nothing seems recorded, save that a sermon was preached before her by Richard Duke on the 29th August from 1 John ii. 6, and published by her command.

Her expenses in August†—

Disbursed	£3	12	9
Buttell et Cell	8	7	6
Gardrobe...	795	5	6½¼
Coquin	38	16	3½
Pullet	30	13	7 ¼
Scutt	2	18	5 ¼
	£879	14	1½¼

In September—

Dispensa	£10	7	8
Buttill et Cell	15	13	11
Gardrobe	715	17	7½
Coquin	89	16	11
Pallet	40	2	2
Scuttill	13	9	9
Aul et Cam	23	0	0
	£908	8	0½

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* *London Gazette.* † Treasurer of the Chamber, fol. 105.

The expenses extraordinary in the stables from 1st July to 30 September were £447 0s. 2d.*

For comparison, the expenses were :—

In April, at St. James's	£306	0	11½
„ May, „ St. James's and Windsor	366	7	2½¼
„ June, „ Windsor	512	14	0½
„ July, „ Windsor	584	16	7
„ Aug., „ Windsor	348	0	8

This last must be added for the month to the expenses in going to and at Bath, making together £1,227 14s. 9½¼d.

The Court business, as before, had to be attended to, and again, From our Court at Bath, was issued a Proclamation proroguing the Parliament.

With no further record the Queen and her husband set out from Bath on Thursday the 7th October, lay that night at the Duke of Somerset's ; on the 8th at Col. Dolman's, near Newbury, so often visited before, and arrived at Windsor in the evening of the 9th, all in very good health.

Charles Moore, F.G.S., and his Work ; with a List of the Fossil Types and Described Specimens in the Bath Museum.

A committee was appointed at the meeting of the British Association at Leeds, 1890, to consider the best methods for the registration of all type specimens of Fossils in the British Isles and reporting on the same. A circular was accordingly sent round to the curators of Museums and owners of private collections for information on this subject. Mr. Edward Wilson, F.G.S.,

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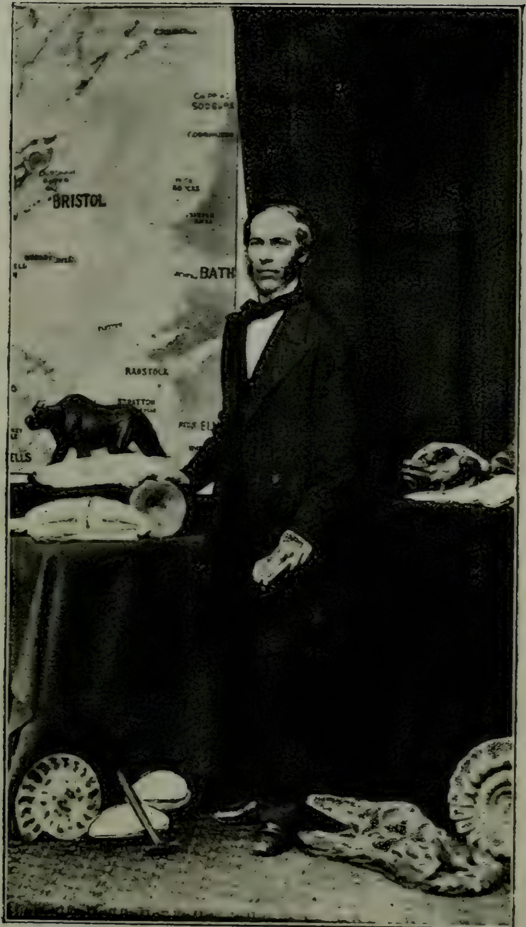
* Excheq. Q.R. Miscell. Wardrobe, $\frac{8}{2}$.



Charles Moore, F.G.S.

BRITISH MUSEUM
NATURAL HISTORY

the hard working curator of Bristol Museum, who had taken an active interest in carrying out the wishes of the committee, and has already published a list of Fossil types in the Bristol Museum, and made a catalogue of the same in the Woodwardian Museum, Cambridge, wrote to me during the summer of last year respecting

time my reasons for the following notes.

Time passes so rapidly (especially with those who are advanced in years) that it is difficult to realize the fact that a decade has slipped away since that eager, anxious, worn face was amongst us, working to the last with indomitable pluck at his engrossing pursuit, fighting against that insidious disease to which he finally succumbed—but so it is. Those of us who have the list of

ERRATA ET CORRIGENDA.

Page 233, line 4, *dele.* "and made a catalogue of the same in the Woodwardian Museum, Cambridge."
,, 238 ,, 26, for "marvelously" *read* "marvellously."
,, 238 ,, 2, from bottom, for "monogram" *read* "monograph."
,, 241 ,, 4, from bottom, for "Thecideum" *read* "Thecidium;" and for "Rhynconella" *read* "Rhynchonella."
,, 241 ,, 3, from bottom, for "Spirifer" *read* "Spirifera."
,, 242 ,, 17, for "Thecideum" *read* "Thecidium."
,, 249 ,, 6, for "is" *read* "it."
,, 251 ,, 4, for "Ovibus" *read* "Ovibos."
,, 251 ,, 21, for "Artic" *read* "Arctic."
,, 255 ,, 26, for "Rushton" *read* "Ruishton."
,, 263 ,, 24, for "Rhynconella" *read* "Rhynchonella."
Last page of "List of Papers," &c., facing page 293, line 5, *dele.* "Geol. Mag. vol. xi, p. 57."
,, ,, line 13, for "Cotlehderma" *read* "Cotylederma."

the hard working curator of Bristol Museum, who had taken an active interest in carrying out the wishes of the committee, and has already published a list of Fossil types in the Bristol Museum, and made a catalogue of the same in the Woodwardian Museum, Cambridge, wrote to me during the summer of last year respecting the many valuable type and described Fossils in the Bath Museum, suggesting the desirability of drawing up a list of these, and of this being published in the Proceedings of our Club; he at the same time undertaking the catalogue if I would contribute a few introductory remarks on the scientific work of the late Charles Moore and his labours in the Geological field. Every facility was afforded him for the inspection and examination of the specimens during the prosecution of the work he so willingly undertook, and the accompanying valuable catalogue is the result.

Whilst preparing a few data to carry out my portion of the work a visit to our venerable President in the autumn acted as a stimulus to my intention; for whilst talking over the affairs of the Club (in whose work he still takes such a warm interest) he alluded to the fact that there had not been any record in our Proceedings of Charles Moore's Geological work, and to my great delight said, "If you will undertake to do this I will give you another paper this session"—hence that admirable paper, given on the 11th November, on "The Distribution and Movements of British Animals and Plants," marked with his usual accuracy of observation and lucidity of diction, showing no abatement in his accustomed intellectual vigour. These preliminary remarks I thought might interest our members and explain at the same time my reasons for the following notes.

Time passes so rapidly (especially with those who are advanced in years) that it is difficult to realize the fact that a decade has slipped away since that eager, anxious, worn face was amongst us, working to the last with indomitable pluck at his engrossing pursuit, fighting against that insidious disease to which he finally succumbed—but so it is. Those of us who have the list of members for 1881 will see the name of Charles Moore near the head of the list with a star against it; he, together with Christopher Broome, Prebendary Scarth, and Leonard Blomefield, being the only starred (*i.e.* original) members of the founders of the Club in 1855 then remaining. In the following year, 1882, one star is absent from the list; since then two others have set, one now alone remaining.

The ancient town of Ilminster, in the county of Somerset, the home of the Spekes, (one of whose distinguished sons in company with the then Capt. Grant, just deceased, was the great African traveller,) and the burial place of Nicholas Wadham, the founder of the college at Oxford of that name, was also the birth-place of Charles Moore, an equally distinguished man in his way. His father, John Moore, had six children by his wife Sophia (*née* Eames), three sons, William, Charles and John, and three daughters. The subject of these notes (the third child but second son) was born on June 8th, 1815, and baptized on 6th of August following at the Old Unitarian Meeting House. At an early age Charles was sent to the Commercial School, and continued his education there till the Midsummer of 1827, when he passed on to the Free Grammar School, remaining there under the tuition of the Rev. John Allen, M.A., the head-master, one year. At the following Midsummer he left and assisted his father in conducting the business of a bookseller in the same town; and also his Uncle Samuel Moore, who carried on a like business at Castle Carey. About the year 1837 he appears to have first come to Bath, and was connected with Mr. Meyler, the well-known bookseller in the Abbey Churchyard. Here he continued till the death of his father in July, 1844 (his mother having died several years previously), when he returned to Ilminster and together with one of his sisters (his eldest) continued the business for nine years, till 1853, keeping a home for themselves and the younger sister. The two brothers, William and John, seem to have left England at this time, their departure being a relief to all the family. In that year he returned to Bath, and was married by Dr. Binney at the Weigh House Chapel in London, since pulled down, to Eliza Deare, of 6, Widcombe Crescent, who now survives him. A fortunate marriage for him, affording him leisure and means to pursue his favourite study; giving him also a *locus standi* in the city, which henceforth became his home, and the scenes of his active city life, as well as the centre of his geological pursuits!

Such are a few of the details of his early life, for which I am indebted to an old resident in Bath (Mrs. Jeffery) who in past days was acquainted with the Moore family at Ilminster. It may be of interest to add here that the Moore family had musical talent; the grandfather, described as "a fine specimen of an upright straightforward man," played the bass viol in the Unitarian Congregation, and the whole family seem to have taken up some instrument or other; Charles played the flute and led the choir in Trim Street Chapel for some time, so long as his voice served him, while his youngest sister occasionally sang at the Pump Room Concerts in Bath. During his connection with Mr. Meyler, he was a regular Sunday School teacher and a most regular and constant attendant at the Chapel, morning and evening in all weathers (so long as his health permitted), and an active helper in various organisations connected with that body. The same energy that he showed in all his pursuits in life was conspicuous in his politics. Wherever there was a party conflict, Charles Moore was in the thick of the fight, and always on the Radical side.

But let us pass over his politics and consider that scientific side of his character which has rendered him so famous, and entitled him to the well-known and well-earned position of *the* foremost geologist of Somerset, and *one* of the foremost in England. Possibly his environment may have served in no small degree to mould his tastes. To an enquiring spirit like his, the surroundings of his native town must have afforded many an occasion of presenting to his mind the "how" and the "why" of nature's wonders. The walls themselves of the Commercial School, with which he was so familiar, were built up of Ammonites and Belemnites, locally called "ladies' fingers;" few places could boast of such medals of creation as a short ramble would disclose in the Upper Lias strata around his native town. "In my schoolboy days," he writes in one of his early papers, "my half-holidays were often spent in collecting the Ammonites with which the beds in the Upper Lias in the neighbourhood of Ilminster abound, for the purpose of rubbing them down to show their sparry chambers." This amusement, however, for a time seems to have been forgotten on his engaging in the active bustle of life. During, however, his first residence in Bath (between the years 1837 and 1844) his rambles in the quarries of our district served to revive his dormant taste for geology, "a taste, which once cultivated," he says, "is rarely lost." It was about this time, on his return to his native place, that his attention was redirected to the study by an incident which has often been mentioned and which seems to have been the chief cause of his awakened interest. "An old civic building, near the Commercial school-house, in which he had passed his early days, was being renovated, and two of the boys were amusing themselves with a pebble, or nodule, they had found in the rubbish. This, in rolling from one to another, separated, and, by a lucky chance, the pieces were looked at and preserved. In the centre, and naturally at the point of separation, was a beautiful fish, of the extinct genus Pachycormus."* This was the first beginning of that magnificent collection of fishes which now enrich the Bath Museum. Before leaving his native town he had accumulated most of the characteristic fossils of the district, and after repeated visits there, of a few days at a time, made himself thoroughly acquainted with its physical and stratigraphical geology. The fame of this busy and intelligent Somerset worker seems to have attracted about this time the attention of the London geologists, and I well remember the story he told me of a patronising visit paid to his humble residence by some of the magnates of H.M. Geological Survey, who were at work in the district; how they made use of his detailed knowledge of the locality without apparently any acknowledgement of the source whence it came. This, and subsequent treatment which he received, may have induced him to entertain that jealous suspicion of professional geologists which, though somewhat modified in later years, when a more generous spirit of appreciation of his great work prevailed, he entertained towards them almost to the last.

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* Vide his speech at the Guildhall during meeting of British Association in Bath, 1864.

In his early days at Ilminster he seems to have been fortunate in making the acquaintance of Mr. Norris, a general medical practitioner at S. Petherton, a man of considerable culture, an ardent geological and palæontological student, and often corresponding with such men as Lyell, Mantell, and Murchison. His father (Mr. Hugh Norris, the well-known antiquary and late one of the Editors of the Somerset and Dorset Notes, tells me) was always ready on a leisure evening to welcome the visits of the retiring but enthusiastic young printer; on which occasions they would shut themselves up in "the museum," as his father's den was called, and spend a pleasant hour in discussing the treasures of the neighbouring rocks and quarries. And with pardonable pride he expresses his conviction that the elder student's encouragement exercised a real influence on the young Moore's future career. It was about this time too that he seems to have become acquainted with Thomas Rupert Jones, late Professor of Geology at the Staff College, Sandhurst, and to have visited with him the "stone pits," as they were called, near Ilminster. How often does the student, who has become eminent in any scientific or other pursuit in after life, date his success from the day when a "deus dignus ex vindice nodus" appeared to solve some knotty question or encourage his flagging energy. Brothers of the hammer have many such experiences.

In the year 1849 we find his name appearing before the public. The first meeting of the Somerset Archæological and Natural History Society was held at Taunton, under the presidency of Sir Walter C. Trevelyan, when the celebrated Dean of Westminster, Dr. Buckland, gave an address on the geology of the district. Charles Moore was evidently present, for we find that he exhibited in the temporary museum "a rich collection of fossil fish and insects from the Lias near Ilminster." In the following year (1850) he addressed an Evening Meeting of that Society at Bridgwater on the Lias formation, and promised to embody his views in a future paper. This was read at the Bath meeting on Sept. 21st., and published in the Proceedings for 1852 (vol. ii. p. 61) under the title of the "Palæontology of the Middle and Upper Lias," and contained an interesting account of his early days at Ilminster, and his researches in the Middle and Upper Lias beds of that locality. Until very recently those beds, he writes, were supposed to belong to the Inferior Oolite, and he claims to have placed them in their true position, as underlying and distinct from the Inferior Oolite ; asserting that from his intimate acquaintance with the Lower Lias beds at Twerton, and those of the Inferior Oolite in the neighbourhood of Bath, he was able to show that they hold not only a distinct position but also a fauna peculiarly their own. It was in this paper that he alludes to the discovery of that marvelously rich yellow Limestone band in the Upper Lias, only from 4 to 5½ inches thick, called the "Saurian, Fish and Insect bed," from which he obtained his beautiful Pachycormi, now deposited in the Bath Museum and still awaiting some specialist to describe.*

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* Since this was written, Arthur Smith Woodward, F.G.S., of the British Museum, has visited the collection and is preparing a monogram on these fossil fish of the Upper Lias.

It was from this nodular Limestone also that he uncovered his "Baby Saurian" as he called it, the Pelagosaurus Moorei (Deslongchamps), the story of the finding of which he graphically told to the writer of the present notes; and the history given in a subsequent paper on the "Middle and Upper Lias of the S. W. of England," (Som. Arch. and Nat. Hist. Soc. Proceedings, vol. xiii., p. 181, 1865-6)—one among the many instances of this man's patient industry and indomitable perseverance. The way in which he described to me how he returned time after time to search over the quarried blocks from which he first picked up the broken bit containing a portion of the jaw, but all in vain; and then determining not to give up the search as hopeless, again returned and fitted it on to the unquarried and original bed in the section, and finally developed a new genus and species of Saurian; and last, but not the least most instructive reward of his skill, displayed under one of the scutes, the last meal eaten previous to death (a Leptolepis in the lizards stomach), was a lesson never forgotten, but one too seldom followed!

His mind at this time was evidently bent on further new discoveries in his favourite beds. He laments the absence of any trace of Pterodactyles already found in Lower Lias beds elsewhere; or of birds, whose footstep-impressions existed in the New Red Sandstone. The idea of the possibility of this discovery seems to have been cherished for a long time, until at the latter period of his life it issued in his too enthusiastic attempts to find traces of the latter in the Palæozoic rocks—but of this anon. In one instance, however, his sanguine temperament met with its reward in subsequent years, alluding to the absence of Mammalia in these beds, though found in the Stonesfield Slate above, he writes, "I do not despair that these traces may some day be found to have their representatives in the Upper Lias." It was his lot to find these traces even lower down and in older beds than in the higher flights of his fancy he could have supposed probable, for we see him with no unpardonable pride exhibiting at the Meeting of the Society in

Glastonbury, in 1859, his recent discovery of Mammalian remains from the Rhætic fissures in the Carboniferous Limestone, near Frome.

Elected District or Local Secretary for Ilminster, in 1851, at the Evening Meeting of the Som. Arch. and Nat. Hist. Soc., held at Weston-super-Mare in September of that year, he communicated a paper on the Aptychus; a favourite subject of his and one to which he was giving his attention during the latter years of his life. In this paper, after alluding to the views of Prof. Forbes and Mr. Strickland, who considered it to be the *operculum* of the Ammonite, he establishes its connection with the latter cephalopod by the fact that he invariably finds it associated with that fossil; that he had been able to make out about ten species of Aptychi from the Upper Lias at Ilminster, and that a particular form is always allied to a particular species of Ammonite, and has, therefore, some as yet unascertained functions in connection with it. He, however, doubted whether it was an *operculum*, giving amongst other reasons that the Nautilus, its nearest ally, does not possess any *operculum*. In a paragraph concluding this paper, he states that since he first read it he had learnt that Von Buch had mentioned its discovery in a Scaphite, and that T. Rupert Jones (the then Assistant Secretary of the Geological Society) alludes to the occurrence of one holding its proper place in an Orthoceras. Thus it was connected with three genera of Cephalopoda, in each of which it was destined to perform the same office.

At a subsequent Evening Meeting held at Taunton during the winter of 1850-51, he read a paper "on Microscopic Fossils," but this does not appear to have been published, nor the one read at Yeovil (1853) on "Fossil Infusoria," (now called Foraminifera). At the Taunton Meeting, 1854, in his paper on "New Brachiopoda from the Inferior Oolite of Dundry" he alludes with regret to his removal from his old haunts (the rich geological locality of Ilminster), to Bath, the scene of the former labours of Walcott, William Smith and Lonsdale. This regret, however, was softened by the hope that something might still be left for him to accomplish. He was then actively engaged in the arrangement of his collection, which he intended to form as a free museum for the city. For this purpose he had come to an agreement with the authorities of the Royal Literary and Scientific Institution to deposit his specimens under their roof on certain conditions. These they seem to have been very glad to accede to at the time, as their finances were as usual at a very low ebb, and the lectures held in the large room proving a failure, this room was given up to Moore's collection; and here it remained during his life-time, an advantage, as he considered it, to the Institution, and at the same time a great convenience to himself and fully meriting the world-wide reputation accorded to it. Owing to recent changes, which were thought by some conducive to the interest of the Institution, the cases have been relegated to an upper room built for the purpose; the "Field" collection of Minerals and the Saurians still on the walls being dissociated from the other specimens, the room reverting to its old uses of a lecture hall. The close attention necessitated by this arrangement of his collection prevented him from becoming familiar with the geological details of the neighbourhood. Future researches, however, soon rewarded the keen eye and the busy hammer, and he soon finds that there is something left for him to accomplish, his fame *crescit eundo.* Report reaches him that valuable beds of stone had been found at Dundry, near Bristol, the old hunter is off to his happy hunting grounds and visit after visit is paid to the quarries and sections in the neighhood. The result being (as he tells us) that from certain thin bands of sandy clay (two cwt. of which he examined under a lens daily for several months) on the N. side of the hill near the village of Bishport, he discovered a series of minute Brachiopoda hitherto unknown, *i.e.*, Zellania, Thecideum, Rhynconella, and Spirifer, figured and described in that paper.

At the next meeting at Dunster, in 1855, he gives an interesting account of further discoveries made in the Oolite in the neighbourhood of Dundry and Bath, and embodies them in a paper read at Clevedon in 1860 (vol. x., pt. ii., p. 155). He had been busily at work at the Hampton Rocks and elsewhere in the vicinity, making further additions to his list of Brachiopoda and collecting materials for his description of the developement of the loop in Terebratella. About this time he appears to have been in communication with Mr. Davidson, and was of much service to him in the preparation of his great monograph upon the British Brachiopoda, published by the Palæontographical Society. A letter appears in the Geological Magazine for 1868 (vol. v., p. 343), in which he defends himself against certain criticisms from C. J. A. Mëyer (p. 270) on the development of the loop in the Terebratulidæ As a proof of the correctness of his figures he states that the original sketches of the loops were carefully drawn by Mr. Davidson, a sufficient guarantee of their correctness; and concludes with the statement that he had just found the genus Thecideum in one of the lead veins of the Carboniferous Limestone of Yorkshire—a genus not hitherto found in England below the Lias, or on the Continent below the St. Cassian beds. The precise age of the vein would have yet to be determined.

At Ilminster, in 1866, he read his well-known paper "On the Middle and Upper Lias of the S. W. of England," (Proc. Som. Arch. and Nat. Hist. Soc., vol. xiii., pt. ii., p. 117), in which the results of his work and discoveries in these formations are summed up, containing a mine from which subsequent observers have largely drawn. At the end of the paper is a communication signed "H. B. B.," (Hy. B. Brady) on the specimens of Upper and Middle Lias Foraminifera,* sent to the writer by Charles Moore, and allusion is made to the various notes which have appeared from time to time in scientific periodicals since Mr

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* This was probably the paper on "Fossil Infusoria," alluded to op. cit. 240.

Moore first directed his attention to the subject. Three well drawn plates accompany the descriptive list of the genera and species. The original drawings for these plates were done by his sister, who was of great assistance to him in his illustrations, and whose decease before his own he always deeply regretted.

One other contribution was made to the Society at their Axbridge Meeting in 1868, "On the Geology of the Mendips"; but this appears to have been a short epitome only of a more elaborate communication to the Geological Society the preceding year, and made more with the object of treating of the physical revolutions which had been in progress in the area, than to refer at any length to the still more interesting palæontological facts thereby involved. At the same time, he incidentally mentions the discovery of a bed of Shale in the Radstock coal field, almost entirely composed of the minute seeds of the coniferous plant, *Flemingites gracilis;* and accounts for the Mendip upheaval by volcanic agency, stating that the presence of this agent he had recently discovered in the Basaltic dyke, near Stoke lane. In an address on the Banwell bone caves "delivered before the Society (probably the Som. Arch. and Nat. Hist. Soc., though the name is not mentioned) at the *Cheddar Field Meeting, 1877," this view again crops up. He there expresses his dissent from the theory attributing the formation of caverns in the limestone districts to the action of water, thinking that was not a sufficient agent; and states his opinion that the fissures were first formed by volcanic action and subsequently enlarged by the influx of vast streams of water due to the melting of the ice that covered the neighbouring hills in the Glacial period. This view of volcanic agency he clung to persistently throughout; to most geologists however at the present day he seems to have strangely disregarded the more generally received opinion that this volcanic outburst was the *result* not the *cause* of the Mendip disturbance. This was apparently his last contribution to the Som. Arch. and Nat. Hist. Soc.; but up to the year 1876, he was generally present at their meetings and took part in their excursions, ready, whenever called upon, to give them an account of their geological surroundings. On one occasion he gives a short lecture from Glastonbury Tor; he speaks to them at the West Leigh quarries; he gives an able address on the geology of the Shepton Mallet district at their Meeting in 1865, alluding to the "few yards of earth from Holwell, near the Vallis, containing a million specimens of organic remains;" at their Meeting at Frome, 1875, he takes them to the Holwell quarries and points out the spot where he discovered the twenty-seven Microlestes teeth and whence he had carted to his cellar for the sum of 55s, the three tons of greenish clay, from which, with patient industry, he had picked out one by one, after three years' toil, that fine collection of fish and reptilian remains now in Case No. 39 of our Bath Museum. And finally at Bath, in 1875, he discourses to the members assembled in his room at the Institution, on the magnificent result of his labours there gathered together in illustration of the ancient history and the physical conditions of the Bath district and the County of Somerset; in which, he ventured to hope, he had been to some extent successful—a hope, which in the opinion of his geological brothers, has been most fully realized. One other communication, however, must not be overlooked. During one of the Society's excursions to Bathampton he pointed out the spot on the S. side of the canal, opposite the church, where he had recently found a quantity of irony slag or cinder mixed up with Samian ware and other Roman remains, overlying the "Mammal drift" gravel. He considered this to indicate the site of a Roman smithy.

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* If this be correct this was his last attendance at the Society's Meetings.

Elected a Fellow of the Geological Society of London in 1854, he contributed five valuable papers to their journal. The first in 1860, "On the so-called Wealden beds of Linksfield and the Reptiliferous Sandstones of Elgin," directed attention to the similarity of appearance between these Linksfield shales with their limestone beds, and those of the Bone bed series (at the base of the Lias) at Pylle Hill near Bristol, at Aust Passage, and at Penarth, also at the Uphill cutting on the G.W.R. The lithological resemblances were well marked ; and he recognized the "White Lias," the "Cotham Marble," the "Bone bed," and the Gypseous clay bands of the S. country in the quarry at Linksfield. The palæontological evidence, moreover, supported his correlation of these beds. As to the Cornstone at Linksfield, on which the above mentioned beds rest, he thought they were of Triassic date, as he had observed on the flanks of the Mendips and elsewhere stone of a similar aspect belonging to the Trias and occasionally yielding remains of reptiles and fishes. In this paper he mentioned his discovery of reptilian and mammalian teeth near Frome, in a fissure containing a Triassic deposit, and ventured to correlate them with the reptilian remains found at Lossiemouth, and therefore the probable Secondary age of the latter. This paper, especially the latter portion of it respecting the Triassic date of these sandstones, was probably considered too heretical for the then views of the Council and was consequently only inserted in abstract.

In the following year (1861) his second paper "On the Zones of the Lower Lias and the Avicula Contorta Zone" appeared. Since the publication of Dr. Wright's paper the preceding year "On the Avicula Contorta Zone," the details of the Beer Crowcombe section had been more fully worked out, and he was now enabled to establish the exact relative position of that Zone. This was the more necessary as he considered that Dr. Wright had reversed the proper order of the Lower Liassic Zones, asserting that he had incorporated the White Lias of William Smith, Conybeare, Phillips and other geologists, with the *Ammonites planorbis* Zone. The explanation he gave of this error being that Dr. Wright had mistaken the cream colour of these beds in the section (a colour which is only superficial) for the true White Lias below them, which had a creamy white fracture throughout.

This explanation of the mistake naturally nettled so eminent and enthusiastic a geologist as Dr. Wright, and was, no doubt, one of the causes which in subsequent years led to so many passages of arms between these local champions. However, Moore's views as to the true position of the White Lias were undoubtedly correct. And the removal of these beds from their former Liassic position and their classification with the Avicula Contorta Zone and Bone bed below, under the title of the "Rhætic Formation;" and their equivalence to the Kössener Schichten or Rhætic beds of Gümbel, has since been confirmed by the later researches of every geologist. His reputation as one of the foremost geologists of the day need rest on no other claim than this, that he was the first to recognize the existence in England in those few (35) feet of clays and limestones between the New Red and the Lias, the diminutive representives of such an enormous thickness (some 4,000 or 5,000 feet) of strata in the Austrian Alps; and so full of such an interesting and distinctive fauna, to which the name of "Rhætic Formation" has been applied. About this time we find that his attention was directed to Australian geology. Having undertaken the post of Emigration Agent in Bath he had naturally much intercourse with Colonials, and fossils and other specimens were sent to him for examination; a fine collection of Australian fossils, some of which are arranged in the drawers beneath the cases in the Moore room, others relegated to the vaults beneath the Institution, were sent to him from the neighbourhood of Wollumbilla, Queensland, and from New South Wales. The search for gold about this time had caused attention to be turned to the nature of the strata; hitherto, but little was known beyond the fact that the deposits were either Palæozoic or Tertiary, the prevailing opinion being that the intermediate formations were entirely absent. Recent researches had, however, shown that some of the Mesozoic beds were represented on this great continent. And in his third paper, published in the Q. J. G. S. (vol. xxvi., p. 226) he gave a description of Australian Mesozoic

Geology and Palæontology, with 9 plates of fossils; and offered more detailed evidence than had hitherto been given as to the existence of a Secondary fauna in W. Australia and in Queensland. His practical and intimate acquaintance with the English Secondary rocks enabled him to refer the greater number of the specimens to the horizon of the Lower Oolites; indeed, he did not hesitate to state that the matrix of some of the Upper Lias forms was identical with that ferrugineous limestone on the same horizon near Bath; so that he claims to have established for the first time the presence in Australia and Queensland of the Middle and Upper Lias, and of the Lower and Upper Oolitic fauna. Noticing that they did not come from beds in *situ* but from derived boulders and superficial deposits, he draws the conclusion that from their being found in such widely distant localities as W. Australia and Queensland, the denudation of the Secondary rocks between the deposition of the Palæozoic and Tertiary beds must have been enormous.

It is noticeable that this was a "Postponed Paper" again; probably his views as to the right of comparing European fossils with those in such a distant part of the world, and judging the age of the strata from their resemblance, was too much in advance of that time; though the President, Mr. Prestwich, reminded the objectors of the fact of identical species, and to a great extent a similar fauna, being found in our seas at the present day more than 180° apart. His paper, too, in the same year (1869) on the discovery of plants and insects in a small block of chocolate coloured micaceous laminated Marl, from the Tertiary beds of the Rocky River, New South Wales, was at first only given in abstract, but follows in full after the former one.

The result of his many years work amidst the Secondary rocks of the district was laid before the Geological Society on March 20th, 1867, under the title, "On Abnormal conditions of Secondary deposits when connected with the Somersetshire and South Wales Coal-basins; and on the age of the Sutton and Southerndown series."

Again we find that it was a "Postponed paper." First of all it was printed only in abstract with the following remark (vol· xxiii., p. 207) "The publication of this paper is unavoidably deferred." Now, I am able to give an explanation of this; Moore had previously asked me to look over some of his proofs before final revise, and consequently we had frequent communications together and many of his grievances, supposed or real, were confided to me; the reason of this postponement was a very sore point with him. The latter part of the paper dealt with a subject which the H.M. Geological Survey had not quite made up their minds upon—viz., the age of the Sutton and Southerndown series. An amateur had stepped in and ventured to put the finishing stroke to an edifice which they considered to be peculiarly their own. Consequently this paper of Moore's was deferred until one of their own staff had been sent down to examine and report. Hence we find time was allowed for the preparation, reading and prior publication of Mr. Bristow's paper "On the Lower Lias or Lias Conglomerate of a part of Glamorganshire." Charles Moore's contention that the Sutton and Southerndown beds were Liassic and not Rhætic, as had been formerly asserted, was most fully corroborated by Mr. Bristow's examination, and though since disputed, as the views of many an old worker has been and will be, yet it still remains unshaken. To the outer world and those not acquainted with the arcana of red tapism Mr. Bristow appears to have gained the κυδος, whilst Charles Moore was the first who did the work. Such were the reasons for the delay in publishing his paper as told to me at the time.

Here I may remark that many results of Moore's work leaked out before he had described them in print; he was always a slow writer and took a long time before making these results public. It was owing to this that the "special paper" which he promised upon his discoveries in the Microlestes quarry at Holwell never saw the light. This and many other facts which he trusted to his too retentive mind being now buried with him, and lost to science.

Though several valuable contributions had been given on the geology of this district; *e.g.*, Messrs. Buckland and Conybeare's observations on the S. W. coal district of England, and that on the Formation of the rocks of S. Wales and the S. W. of England by Sir Henry de la Beche—elaborate papers in their way and affording much help to Moore, as acknowledged by him—yet is must be allowed that to him it was given to work out the details of the sections as had not been done before. In this paper, giving his reasons for the abnormal character of the Secondary formations on the N. of the Mendips, he speaks of the difficulties attending the investigation of his subject and the length of time occupied; corroborates Godwin-Austin's view of an old land area near Frome, and shows that this may be looked for in the Mendip axis of elevation, by his discovery of Mammalia, Reptilia, and terrestrial Mollusca that once inhabited this land area in Rhætic and Liassic times. The barrier of land, thus interposed to the incursion of the waters of the Secondary seas, modified the physical features of the whole line of country between Frome and a portion of S. Wales, thus accounting for the extreme tenuity of the Secondary deposits to the N. of this barrier as compared with those on the S. With the one exception of the statement of his views as to the Basaltic dyke, this contribution will remain the best authority on the geology of a portion of England surpassed by none in geological interest; and will serve as a mine of information* to many a future explorer of that particular district, as it has done to many a past one. This paper alone was sufficient to establish his reputation as one of the leading geologists of the day.

The last paper contributed to the Geological Society was read in June, 1878, and published in Q. J. G. S., vol. xxxiv., p. 914, on the Palæontology and some of the Physical conditions of the Meux-well deposits. Remarking on the accuracy of Mr. Godwin-Austin's theory that a ridge of Palæozoic rocks passes under the

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* See the details of the numerous sections.

Secondary beds in the S. E. of England, as proved by the recent deep well borings around London; and reminding the members that he had in a former paper described the peculiar physical conditions of these Secondary beds, when seen for the last time at the E. of the Mendips, resting on the Carboniferous Limestone, he was anxious to ascertain whether similar conditions prevailed in these deep borings near London. For that purpose the authorities at Meux-well, in the Tottenham Court road, had sent him down from time to time some samples; these he had washed and examined with the following results. The first 1,000 feet presented the usual lithological characteristics of the Chalk, Greensand and Gault; the next, 57 feet down to the Devonian shales, though considered to represent the Lower Greensand, he looked upon as abnormal; entirely calcareous throughout, they appeared like granular and conglomeratic Marls, such as might be deposited in hollows and subjected to the influence of currents of water. From this Oolitic-looking material he collected no less than 85 different kinds of organisms, indicative of an admixture of marine and lacustrine life.

Amongst the Foraminifera which were rare he recognised the "tubular continuations" of the genus Carpenteria, hitherto only found recent in the Southern seas. He was able also to extend the range of Thecideum and Zellania, and thus added considerably to the fauna of the Neocomian or Lower Cretaceous period in this country.

A paper from Prof. Prestwich on the deep borings at the same place, at Crossness and at Shoreham in Kent, preceded Moore's that evening; and in the discussion that followed, with reference to both communications, Prof. Judd expressed his agreement with the view taken by Mr. Etheridge and adopted by Mr. Moore, that the fossils were undoubtedly Neocomian.

Not unmindful of the claims which local societies had upon him, we find many short communications scattered here and there in their publications upon his one engrossing topic, *e.g.*, in those of the Cotteswold, Bristol and Cardiff Field Clubs. Notably at the opening Meeting of the Blackmore Museum at Salisbury, on 5th September, 1867, he gave a short account of the presence of the Bubalus (since named by Prof. Boyd Dawkins, Ovibus) Moschatus in the drift of Wiltshire. This animal allied to the sheep rather than the ox, and now driven into the inhospitable regions of the Arctic circle, had been found only in five localities in England. The first near Maidenhead, the second between Limpley Stoke and Freshford, the third nearer Bath, the fourth at Bromley in Kent, and the fifth, and most perfect specimen at Crayford. The Mammalian drift in which these were found covers the Bath basin to the depth of 10ft., and extends as far as Bradford. In this drift, near Freshford, he found the head of the only female known, having previously discovered that of the bull near the same place, both are deposited in the gallery of the Bath Museum together with a very fine tusk of Elephas primigenius from the same spot and close by one of the heads. Remains of Rhinoceros, Cervus and Bos were also found by him in these gravels, and he draws attention to the curious and well-known fact of the bones of animals usually denizens of the Tropics associated with those characteristic of the Artic regions.

Charles Moore was a frequent attendant at the Meetings of the British Association for the Advancement of Science, and read several papers before Section C. My earliest acquaintance with him was in the year 1863, shortly after my arrival in Bath, when we went together to the Newcastle Meeting as two of the local Secretaries for the Meeting to take place the following year in Bath; and in the Report of the Transactions of Section C., presided over by Warington W. Smyth, F.R.S., is a short abstract of Moore's paper "On the equivalents of the Cleveland Ironstones in the W. of England." He had traced these Ironstone bands from Lyme Regis to Yeovil and Bath. They formed a marked contrast in mineral wealth to those in the North, for where the ore was sufficiently rich to work it was not thick enough, and *vice versâ.*

This was followed by another "On the organic contents of the Lead veins of Allenheads and other Lead veins of Yorkshire." These organisms he considered had been washed into the fissures by the action of later seas, as he had before stated to have been the case in the mineral veins of the Carboniferous Limestones of the W. of England. He draws especial attention to the presence in the clayey infilling of the "New Rake" vein, of a great quantity of "Conodonts"—small tooth and comb-like bodies hitherto found only in the Upper Silurian bone beds, and described by Dr. Pander as fish-teeth, but since defined by Dr. Harley as of crustacean origin. In the following year, in the midst of his arduous labours as one of the local Secretaries at Bath, he found time to lay before Section C., then under the Presidency of Prof. Phillips, the specimens of Saurians, Fish and Cuttle-fish he had discovered in the Upper Lias at Ilminster; and the mammalian and fish-teeth (70,000 in number) obtained from the greenish clay which filled the fissures at Holwell, and the remains of the extinct animals from the drift that surrounded Bath. The President said that the Section had heard one of the most interesting and instructive addresses that could be possibly given to the British Association. They had expected a most interesting communication from Mr. Moore, but not to the full the great treat he had given them, illustrated as it was with specimens of his own discovery of the greatest possible value and interest. Sir Charles Lyell, who was also present, spoke of Moore's discoveries in the Mammalian drift of the Bath basin as rendering essential service to science, alluding especially to his finding the male and female musk sheep in that neighbourhood.

The excursion to Frome and the Vallis under his guidance was a memorable one, and the distinguished savans who were present expressed their great satisfaction at the interesting geological information he had given to them. The acknowledged success of the Bath Meeting, considered to be one of the most brilliant that had ever been held, was mainly due to Charles Moore's unwearied labours and his great power of organisation.

At the Norwich Meeting in 1868, he relates new discoveries connected with Quaternary deposits. In a fissure of an Oolitic quarry at Falkland, to the S. of Wellow, about 40 feet from the surface, he had found a "drift" with a number of teeth and bones belonging to small rodents. Since then he had obtained many genera of the same mammals, associated with fresh-water shells and bog-iron ore, filling up a large portion of the fissures along the escarpments of the Oolites of Somerset and Gloucestershire. Whilst quarrying for stone at Falkland twenty-two hut circles had been destroyed, and he suggested (though without distinct evidence to prove his theory) that the material filling up these hut circles and that of the Oolitic fissures was of the same age. An abstract only of this paper was given, as customary, in the B. A. Reports, and it is much to be wished that he had published a more detailed account of his discoveries for subsequent reference.

At the Exeter Meeting in 1869, he exhibited before Section C. a Teleosaurus temporalis, about 4 feet in length, from the nodular limestones of the Upper Lias, and gave a short account of the beds in which it occurred associated with other organic remains.

A long report also appears at the same time "on Mineral veins in Carboniferous Limestone and their Organic contents." On this occasion he seems to have been aided by a grant from the Association for the expenses incurred in the prosecution of his researches. The first part deals with the phenomena attending mineral veins and the various opinions as to their origin. Discussing the Plutonic and Neptunian theories, he inclines to the latter, dismissing the deposit of the ores by either *sublimation* or *segregation.* In support of the Wernerian view of the marine origin of these deposits he considers three conditions necessary; 1st.—The presence of the minerals themselves in the waters of the ocean; 2nd.—Open fissures communicating with the latter; and 3rd.—Favourable electrical conditions, with time for precipitation. From the organic contents derived from these veins he considered the latter to be of various ages, and gives a long list of organisms he had found in the Charterhouse lead mine, 270 feet deep, and in other vein stuffs sent him for examination from various parts of England, alluding particularly to the curious organisms before mentioned, *i.e.*, the Conodonts. Appended to the report are some notes by H. B. Brady, F.L.S., on the Foraminifera of Mineral veins and the adjacent strata, sent him by Charles Moore for examination, a large proportion representing forms not previously described.

At the Brighton Meeting in 1872, we were associated together as Co-delegates to represent our Field Club, at the Conference held under the Presidency of Dr. Carpenter respecting the organization of Local Scientific Societies; and Moore gave an account of some naked Echinodermata (Holothuria) from the Jurassic beds. One species of these, allied to Chirodota, has its skin furnished with minute wheels, and though of course the soft bodies of these animals have disappeared in a fossil state, yet he had discovered the wheel-like plates of at least four species of Holothuria in the Lias and Oolite; one from the Inferior Oolite, one from the Upper and two from the Middle Lias. These plates were about $\frac{1}{40}$ of an inch in diameter and presented considerable variety in form. One of the prettiest forms from the Inferior Oolite he named after the President of the Association, Dr. W. B. Carpenter, Chirodota Carpenteri. He concluded with the expression of a hope that this interesting class of animals would receive a more systematic study than had hitherto been given them.

At the Bristol Meeting in 1875, he discussed the age of the Durdham Down Conglomerates yielding Thecodontosaurus and Palæosaurus, and considered by Messrs. Riley and Stutchbury, about 40 years' before, as of Permian age, but since then referred to the Magnesian Limestone. He gives his reasons for believing them to be still more recent. In his opinion precisely similar physical mineralogical and palæontological conditions prevailed on the table land of Durdham Down as in the Mendip area. Numerous veins traversed the Carboniferous Limestone; from one of these near the Zoological Gardens he had taken from between the walls of the limestone, 30 feet from the surface, Ammonites, Echini, Foraminifera, and other organisms of Lower Lias age. From another near the Suspension Bridge he had taken fish remains of Rhætic age, including Saurichthys apicalis and Acrodus minimus. In the veins on the Mendips he had found numerous examples of Saurichthys and Acrodus and the same reptilia. From this he concluded that the deposits were equivalent in time, and that the Durdham Down Conglomerates must be referred to the Rhætic age rather than to that of the Magnesian Limestone.

In November, 1880, he recurs again to this subject in a paper before the Geological Soc., (Q. J. G. S., vol. xxxvii., p. 67, 1881) and reviews the decision he had before arrived at, that the Thecodontosaurus and Palæosaurus were of Rhætic age. He gives further particulars of the Secondary deposits near Frome, and describes the occurence of Post Pliocene, as well as Rhætic and Liassic deposits, at the *Microlestes* quarry at Holwell. Similar infillings occurred in the Bristol area, at Durdham and Clifton Downs, in the Avon gorge, at Ashton, Westbury-on-Trim, Nettlebury quarry, near Wickwar at Yate, Clevedon, and on the Thornbury railway; these contained fossil remains of different geological ages. The reptilia from the Conglomerate on Durdham Down had been referred to the base of the Keuper. Lately he had found teeth of the Thecodontosaurus, indentical with those of the Bristol area, from the middle of the Upper Keuper at Rushton, near Taunton; recognizing certain differences between these teeth and those of the same genus from the Rhætics at Holwell, he was led to abandon the notion that the former were of Rhætic age, and now referred them to the Upper Keuper, thus placing them a little lower down in the geological horizon. In the discussion which followed, the President (Robt. Etheridge, Sr., F.R.S.,) congratulated the writer on the industry and skill shown in the collection of the materials on which the paper was based.

A letter appears in the Geological Magazine (vol. ii., N.S., p. 627) December 1875, arising out of an occurrence at the Bristol Meeting of that year, and witnessed by myself, in which he has a shot at his old antagonist, Dr. Wright. Mr. Longe, of Cheltenham, had given to Charles Moore a perfect example of the interesting little Crinoid Plicatocrinus, which he had found in the Lias near Bridport, in Dorset. Dr. Wright, to whom he had first shown the specimen, seems to have referred it to the family Cirripedia; this Moore told Mr. Longe at the time was incorrect as it was one of the Crinoidea, and that he had already found several of that genera and species from the same geological horizon as those found on the Continent. In the meantime, shortly after the Bristol Meeting, a letter appeared in the Geological Magazine for October from Dr. Wright, describing it as Cotylederma, and as the first English specimen of this genus from our Lias beds. To this Moore replies in November, that on his return home from the Bristol Meeting he found that it belonged to Plicatocrinus and not to Cotylederma as he first supposed; he complains that the Doctor had forgotten the fact of his having been shown some examples of that genus in the Bath Museum, and stated that he had taken a beautiful specimen of the genus Solanocrinus, recently found in the Oolitic strata and the first recorded British genus to the Meeting, but had withheld a notice of it in order to have drawings prepared of Mr. Longe's Plicatocrinus.

This little passage of arms between two rival geologists was another intsance of the way in which Moore's discoveries were anticipated, owing to the delay in making them known through the medium of some periodical.

In 1879 he again recurs to one of his favourite subjects, the Aptychi. This was at the Sheffield Meeting of the B. A. Speaking of the great variety of opinion that had existed as to the zoological position of this curious triangular-organism, he said that his doubt that it was the *operculum* of an Ammonite (with which cephalopod it was always found) expressed in a former paper had since then been much strengthened by some new facts. So far as he knew the earliest British Ammonite (A. planorbis) from the Lower Lias was the only species in that formation that had an Aptychus associated with it. The form of this was one-lobed, with coarse concentric lines of growth, and in this species an inner layer was always black, as if stained by some pigment. From the Saurian and Fish bed of the Upper Lias he had obtained microscopic Ammonites in which the Aptychus was seen far back in the outer chamber. A special form seems to be united to each species of Ammonite. On examining the moulds of A. serpentinus he found the surfaces covered with hundreds of thousands of minute "eggs," some apparently hatched. In some cases the siphuncular tube passes over the Aptychus, though not found in actual connection; the question then arose to him: "What has the Aptychus and the tube to do with the eggs?" Microscopic sections of various species revealed the fact that these were invariably cellular, and from these he extracted lines of cell tubes differing but little from the egg packets lying amidst the scattered eggs on the A. serpentinus. These facts seemed scarcely consistent with the *operculum* theory, and he ventured to suggest for the present at least that possibly the Aptychus with the siphuncular tube is an Ovarian sac.

At the Swansea Meeting in 1880, Charles Moore ventured to deal with that most difficult of the many geological questions, the presence of life in the Laurentian rocks of Canada. In his paper read before Section C. under the Presidency of Dr. Sorby, the great microscopist, he refers to the pleasure he had experienced during the Bath Meeting (1864) in assisting Sir William Logan the Director of the Canadian Geological Survey, to unpack the large polished block of Laurentian limestone, since deposited in the Jermyn Street Museum. After hearing the paper then given by Sir William on the presence of Eozoon Canadense (asserted to be the earliest form of life yet found in those 50,000 feet of rocks between the Cambrians and the base of the Laurentian system), he considered the specimens shown consisted of a mineralized or metamorphic condition of rock structure and that they were not organic. Reviewing the controversy which had been carried on for the last sixteen years, he remarked that certain facts which he had since worked out had caused him to alter his opinion. Having decalcified some portions of the rock he had found in it a clear siliceous-looking fibrous growth of various colours, black, green, and olive, but so like modern fibre that he suspected they must have got on the slide by accident and threw away many such specimens. Persevering, however, in his researches, he continued to find other traces which he likened to the finest possible bits of polished golden wire. Examining the structure of *Nummulites lævigatus*, to which Dr. Carpenter and others considered Eozoon to be allied, he found the same transparent alga-like fibre abundant in the decalcified specimens; also deep yellow, emerald green, and olive-coloured fibre, absolutely undistinguishable from those obtained from the Eozoon. From this evidence he was forced to adopt the conclusion of the organic nature of Eozoon Canadense, and suggested that in the vast thickness of rocks between it and the Cambrians connecting links of organic life might still reward the geological investigator. His last appearance was at York in the following year, 1881, when he again brings forward the result of his microscopic examination of the Irish Laurentian and other Palæozoic limestones after being triturated and dissolved in acid; stating the care he had taken to eliminate all sources of error, he still found hair-like structures and feather-like barbs which he considered belonged to the rocks. Notwithstanding Dr. Duncan's reply and his playful allusion to Charles Moore's discovery of the traces of the last visit of the angels to this earth in the fibre of one of the feathers of their wings left behind, and the general opposition this theory met with, Moore, however, was not the man to give up easily an idea that had once taken firm possession of him, and several letters from the leading men of science of the day attest how eagerly he sought information on this subject. He seems to have consulted Darwin on the Aptychus theory, for the latter writes with his usual scientific caution, "The problem about Aptychus, though I know nothing of it myself, has struck me during many years as an extremely curious one"; he suggests that slices should be made through the little globular bodies and their microscopical structure examined if it be preserved; and concludes by writing, "But the whole subject has gone much out of my mind and you probably are a far better judge than I am," and then heartily wishes him success in all his future investigations.

He carried on a long correspondence with Henry Carter of Budleigh Salterton, in the same year, 1879, and sent him some specimens of the egg-like bodies to examine. Of these Carter writes, "I have examined with high powers the supposed 'eggs' you kindly sent me. The latter are some bits of sarcode which have become ferruginized, but from whence they come, or what they originally were, there is nothing to determine. They are of different sizes, often round and often agglomerated, but present no particular form and no structure. Still, they appear to me to have been originally organic, but once ferruginized the roundness and agglomeration become as much mineral as organic, so without form or structure this is all that can be safely said of these 'egg' looking particles. *Nitric acid* does not dissolve them, but *Oxalic acid* renders them more transparent, or rather their fragments when crushed."

An interesting letter from Adam Sedgwick about this time, dated Cambridge, May 31st, 1870, may be given. "I am much obliged to you for your kind letter and for the information conveyed by your papers, but above all for a sight of your magnificent Museum at Bath. The Lias fossils quite astonished me, and so did that most elaborate series of small fossils (including one or two Mammal specimens) which was new to me. I had heard of the fossils but never before seen them. I mean, of course, the fossils of the group immediately under the Lias.* All facts connected with the developement of the Carboniferous group are of deep interest. You are aware that in the north of England and in Scotland coal beds alternate with the Carboniferous limestone down to its very base. A few insects and, I think, a few freshwater shells have been found among such alternating beds, but that fact does not diminish the value of your papers. I should like much to know the details of the discovery of organic remains in Mineral veins. That Mineral veins cut through beds with organic remains is a notorious fact, *e.g.*, the lead veins cutting through the chert beds of Denbighshire. But in 1830 I made a short excursion into Swaledale and I found that in one place the Galena of the lead veins penetrated and perfectly mineralized some of the large Productæ which retained their natural form. I think I have somewhere in my Museum a pretty good Producta absolutely composed of Galena. I wonder whether your case resembles the one I allude to. The lead veins in Swaledale pass through the Carboniferous limestone and I believe that the fossils were all petrified before the veins were injected. The conversion of the Productæ into sulphate of lead I consider a case analagous to the pseudomorphic crystals of tin, which very often in Cornwall replace the crystals of granite. I write in much hurry as I am expecting the arrival of friends from London, and after they leave me I am, D.V., to start on a visit to my native hills in the edge of Westmoreland. Pray give my kind regards to Mr. Jenyns and †Mr. Winwood and any other friends at Bath; nor must I forget Mr. Weston, though he has deserted this mother earth and gone flirting with the fickle moon."

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* "*i.e.* The Rhætic," Moore adds in a note.

† This alludes to a visit paid in my company, during his short stay in Bath, to the section near the Weston Station on the Midland line, when I had the honour and the great pleasure of conducting the enthusiastic and grand old man to the Rhætic section, recently so well

Before bringing these notes to a close it is only right to mention, that Charles Moore frequently acted as guide and instructor to the members of the Bath Field Club in their weekly walks and longer excursions.

Our President in his address to the Club in reference to the death of his friend, C. E. Broome, F.L.S., writes that it was mostly during their quiet walks alone that they carried on their botanical researches. The Club's regular excursions, though very pleasant in themselves, afforded little opportunity for any steady work in Natural History. "I remember (he adds) once, our late much esteemed member, Charles Moore, on its being remarked that he seldom walked with the Club, gave as a reason, that there was "no liberty of action." A large party wending its way to some pre-arranged place or object, can hardly be expected to make any long stand, whilst one of their number searches for fossils, or another looks for plants, stationary work of this kind is best done at other times."

It was was for this reason partly, that we do not find his name more frequently in our Proceedings. Whenever, however, he was able to snatch a day from his more important work, he would accede to my request and either give the Club an account of his discoveries, or conduct the Members to some of his well-known sections, but more frequently he would ask me to join him alone in some geological walk,

I well remember an expedition of the Club to Southerndown, in 1865, when he accompanied us, and pointed out the "Sutton Stone" sections so well displayed along the coast between Sutton

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exposed there. I well remember my anxiety at the time, when with difficulty I prevented him from climbing over the rails and going down the steep bank to examine the section. He was then very infirm, and it was only a very short time before his decease. The "flirtation" alluded to referred to the late Mr. Weston of Ensleigh, who had just built his observatory on Lansdown and devoted his attention entirely to Astronomy.

and Dunraven Castle, and unravelled the geological problems of the district. In 1866, he took the Club to the Mendip Hills, to visit his recent discovery of the "Trap dyke," near Stoke Lane; passing on the way through Shepton Mallet, he called attention to the lithological similarity of the white conglomeratic rock, resting on the upturned edges of the Carboniferous limestone, to the beds they had seen the preceding year at Sutton, so unlike the normal Lower Lias beds, near Weston, yet from their contained fossils evidently of the same age.

In the same year, at a joint meeting of the Cotteswold and Bath Field Clubs, Moore acted as their guide to the Warleigh valley, visiting the gravel beds at Freshford, said to be of the same age as those of Amiens and Abbeville, and in which had been found the Musk sheep and other extinct animal remains; the inferior Oolite section along the canal banks, the 30ft. there exposed representing those same beds in the Cotteswold Hills, developed to a thickness of some 200ft.; the extremely thin beds of the Upper Lias with the Middle Lias at the base, opposite Dundas; and on their return to Bath pointed out the Coralline nature of the top beds of the Great Oolite on Hampton Down. In 1867, he conducted an excursion to the Camel Hill section, near Sparkford Station, and described the Liassic geology of that side (S.) of the Mendip Hills, where the Lias beds attain their normal thickness, some 700ft.; and taking them to his typical classical section so fully described in his paper on the Abnormal Deposits, read before the Geological Society, pointed out the physical and palæontological peculiarities of each bed, from the Keuper Marls at the base through the Rhætic clays to the white Lias, William Smith's "Sun bed," and onward in ascending order to the Blue Lias proper—a succession of beds, 365ft. thick. In the same year, he visited the Willsbridge section, and showed the members the Rhætic and Lower Lias beds, lying in a trough between the Keuper beds on one side, and the Pennant Sandstone on the other; a most instructive section due probably to the disturbance and great faulting of the Sandstone on the N. side. In 1869, he visited his old haunts in the Vallis, and took the Club to a cave which he had partly excavated in Murder-Combe valley, but where a large sheet of water at the bottom had stopped further researches. He had not found anything of importance here; but, as he subsequently told me, the exploration of this cave and his being immured there for some time, owing to the falling in of a portion of the material, laid the seeds of that disease to which he finally succumbed.

In the same year, he joined the Members in a walk to a quarry in the Cornbrash, about three miles from Phillip's Norton, where he had discovered some "hut circles" some 8ft. deep and 9ft. wide, with rude steps leading to them; apparently of a superior type, round and with upper and lower chambers cut out of the rock; at the bottom he had found traces of human occupation. From the fissures in this quarry he had obtained Mammalian bones, and teeth and bones of Arvicola.

This seems to have been the last walk which he had with the Club. He was present and took part in several of their evening and afternoon Meetings. In 1865 he described "the range and structure of Brachiopoda with reference to local species," their first appearance, rise, numerical development through the various formations; illustrating this with various specimens of Crania, Lingula, Rhynconella, and Terebratula from his own collection, ranging from the Lower Silurians to the most beautiful and delicate shells found in our present seas. In 1867 he gave a description of the geology of the Mendip Hills and their former continuation into S. Wales; their upheaval and the doubling back of the coal seams to the N. upon themselves; his discoveries in the fissures of the Carboniferous limestone, and asked permission to name a new species of gasteropod, which he had found in the Southerndown and Brocastle beds, "Fusus Jenynsii," after the President of the Club. In 1868 we find him taking part in an evening *Conversazione,* and describing the abundance of earth worms and slugs that crawled forth at night, even in his small garden, where 25,000 had to his knowledge been destroyed there in one year. He also alluded to a fall of small fish over the N. Parade, between 1837 and 1843. A drawing in sepia from the ink bag of the Upper Lias cuttle fish, done by a lady passing through Bath, was exhibited. The hooklets with which the tentacles of the latter were armed had been found inside the ribs of the Saurians, so that most probably these cuttle fish formed a portion of their food.

One of his most useful papers contributed to the proceedings of our Field Club will be found in Vol. ii, p. 37 (1869). It contains an account of the Mammalia and other remains from the "drift deposits" in the Bath basin during the Post-pliocene, the Prehistoric and the Historic periods. The contents of a Roman coffin found near Sydney Buildings, about 12 feet beneath the surface, served him as a theme for some remarks on his favourite subject. The pounded crystalline Carbonate of Lime with which the coffin was filled gave him a text. Where did this come from? It must have been purposely brought from some mineral district. Where then more likely than from his dear old Mendip Hills, the scene of the Roman lead workings. There was a crack in the coffin lid; through this had filtered in (evidently when near the surface and before the accumulation of the 12 feet of superincumbent soil, and therfore near the time of the burial) a perfect geological collection of small Brachiopoda, corals, and other fossils from the Inferior Oolite, also many recent land shells; lists of which and the contents of the coffin are now seen in the gallery of the Museum. Subsequently to the Roman occupation he considered that the city had been deserted for a long time and converted into a swamp. Evidence of this he adduced in the alluvial marl with vegetable matter (in some cases almost converted into peat) lying on the Roman foundations at the excavations on the site of the White Hart Hotel. The uprush of the hot waters too through their upper beds brings him enough material for a long list of recent and fossil organisms. The fragments of coal in this list is hesitatingly referred to as possibly indicating the passage of the waters through the Coal Measures. Several sections are given of the Mammal drift, which he considered came down the Frome Valley, as it contained rocks evidently from the Mendip area. A list of the bones of the extinct Mammalia is given, and he concludes with speculation as to the age of the extinct animals and some of the beds in which they were found, some 240,000 or 80,000 years ago according to Croll—that far distant time when he describes "our hills as surrounded, if not covered to their highest point, by glaciers," the evidence of whose presence, though not seen on our soft rocks, yet in his opinion might be traced in the troughs and grooves of the stiff clays of the upper beds of the Lower Lias on which the drift invariably rested. He notes the curious fact that hitherto neither by himself or any other geologist has any of the Palæolithic implements indicative of man's presence been found in the gravels of the Bath basin.

On 17th December, 1873, there was a well attended evening meeting to hear him give his reminiscences of the Natural History and Geology of Mentone. He had gone there the preceding winter of 1872 in search of health, after his recovery from a serious attack of illness. The great variety of the botany; the interesting zoology; the abundance of insect and reptilian life, and the absence of small birds (probably the cause of the latter); the startling noises of the tree frogs, and the extraordinary instinct ("if not something higher") of the trap-door spiders were dwelt on. And he concluded with an account of the skeleton of Mentone, which he was fortunate enough to see, before its removal by the discoverer, Dr. Riviere, to Paris. He described the five caverns facing S. in the limestone range of hills, just outside the French frontier. A platform ran at about 100ft. above the Mediterranean, and these caverns are about 40 or 50ft. higher up in the side of the Jurassic hills. In one of these called Baoussé Roussé, the skelton was found, about 8 or 10ft. beneath the surface, the same depth of soil being below it. The floor was one mass of sand and charcoal, but had never been sealed up by stalagmite. Broken bones and thousands of flint flakes had been collected from it.

Moore, though thinking that it was of considerable antiquity, questioned the statement of Dr. Riviere who carried it back to the period of the extinct mammalia. A piece of specular iron ore found in the jaw of the skeleton, probably either placed in the mouth or worn as a charm, was exhibited. In how profitable a way a man with a keen eye for nature's wonders, though an invalid, can spend his time !

His last paper to the Club was read on February 4th, 1880, and gave an account of the Hedgemead landslip. He first describes the formation of the Bath valley by denudation, and alludes to the fact that it was not known until 1864 that a great line of dislocation passed under Bath, as pointed out to him by Sir Charles Lyell. This fault has either depressed the S. side, or elevated the N. to the extent of 200ft. Coming to the cause of the landslip, he attributed it to the natural slipping of the *talus*, aided by water, accelerated recently by the weight superimposed by the number of houses that have been built on the creeping surface. Watching the sinking of a well in the Upper Hedgemead road, not far below the West end of Camden Crescent, he found *detritus* for the first 20ft. ; this rested on Upper Lias clay densely laminated with irregular layers of blue stone, with intermediate beds of clay at the base, 45ft. ; the Marlstone or top bed of the Middle Lias being struck at the depth of 65ft. from the surface. From these Upper Lias clays he found three genera of fish, Hybodus, Lepidotus and Leptolepis, impressions of an Eryon, and gives a list of numerous Mollusca.

We now come to his last appearance at our Meetings, changed from the evening to the afternoon, when a paper was given on Bitumen, its history and origin. Moore joined in the discussion which ensued after the paper, and stated that Bitumen had only been found in England during the last few years, and that it was not generally known that the Lias shales of our own neighbourhood had been found to yield that gas, though not of any commercial value; he advocated the Neptunean theory of the production of Minerals, therein differing from the writer of the paper who had held the theory of the gaseous state of the earth's centre and had attributed Bitumen to that origin.

On February 15th, 1881, the evening Meeting was set apart for Charles Moore and myself, when he was to have communicated his latest investigations on the "Eozoon and Micropalæontology," embodying some of his recent microscopic researches in the Palæozoic rocks. Death, however, had taken away my geological friend, and the pen of the earnest, hard-working student of nature had ceased to write; he had gone to his rest, literally worn out and a victim (may we not say a martyr?) to the cause of science, for which he had laboured and for which he lived. How well I remember the closing scene, or at any rate the last hours spent with him in endeavouring to elucidate the fibre mystery. Possessed with the idea that even in the earliest rocks of the earth's crust he could trace the presence of organic life, he had selected the room in the Institution where the least chance of any adventitious or external accidents could interfere with his researches; he had prepared some glass slides coated with glycerine over-night, these we were to examine the following morning microscopically and compare the results of the night's capture with the residue he proposed to test after decalcification of the rock by hydrocloric acid in the morning. The specimen so tested was a slice of the Laurentian rock containing the so-called Eozoon Canadense. Every precaution had been taken to exclude any accidental introduction of dust from the experiment. After two hours work in the room bare of any furniture that might possibly interfere, he succeeded in fixing on his glass slides certain transparent fibres or tubes obtained from the residue, which, when compared with the dust caught on the slides glycerined over-night, seemed quite dissimilar. How these fibre-looking substances came there I was unable to discover, but there they were. Not being a microscopist myself we consulted together as to the advisableness of asking some three men distinguished in that science to witness the experiments and discover the source of error if any existed. Dr. Carpenter, Prof. Bonney and Etheridge were the three that Moore said he would ask to assist him. I was particularly struck with the zeal of the man, who, labouring under a most distressing cough at the time, and being asked whether he did not feel the cold (I was chilled to the backbone during the time of the investigation in the Lonsdale room at the Institution), replied, " No, I don't, but suppose my enthusiasm has kept me warm." These were the last words I ever heard him utter; in a fortnight after this he was gone. Bath knew him no more—a simple green mound in the pretty little Unitarian burial ground at Lyncombe marks his resting place by the side of one of his sisters, and it is to be hoped that some appropriate record will be erected there to mark the last home of one of Bath's most scientific and hard-working students of nature ere all traces be lost. But his memory remains, and his name, linked with Walcott, William Smith and Lonsdale, will be handed down to posterity as that of a man whose good work in the scientific investigation of the wonders of nature any city may be proud of. *Si queris monumentum circumspice*—The Moore Museum, purchased after his decease by his fellow citizens for a thousand pounds, and secured to the city of his adoption by those who appeciated his work and honoured his memory, is a memorial of his scientific labours. Let us hope that the hands of the unsympathetic temporisers for the hour may not banish his unique and precious collection, so widely known and preserved with so much loving care, to the dark and dusty depths of the Institution cellars, where they have already stowed away in drawers the historical collection of his distinguished predecessor and former Curator of the Institution, William Lonsdale.

I am sensible of my shortcomings and how inadequately Chas. Moore's work has been set before you, but I have done my best in the midst of many difficulties and interruptions to give you an idea of the labours and discoveries of our illustrious fellow-citizen, once a Member of our Club. A man whose scientific acquaintance it was my great privilege to make, and whose presence seems to be with me as I busy myself amongst the cases that contain the results of his life-long work.

Fossil Types in the Bath Museum.

NOTE.—Wherever the generic name appears between inverted commas it is considered either, (1) that the species belongs to a different genus, as indicated by the authors quoted; or, (2) that the generic name quoted is only doubtfully applicable to the species.

Wherever the name of a species occurs between inverted commas it is considered that such species is not rightly constituted, being synonymous with some other pre-established species or another species of Moore's adopted by the authors.

* Foreign species not exhibited. † MS. prepared for the Palæontographical Society but never published.

	STRATA AND LOCALITIES.
MAMMALIA.	
Microlestes Moorei, R. Owen, Pal. Soc., 1871, Mesozoic Fossil Mammals, p. 6, pl. 1, ff. 1—5 and 10—13; R. Lydekker, Cat. Foss. Mamm. Brit. Mus. pt. v, p. 203 (1887). [molar teeth and small anterior teeth]	Rhætic, Holwell.
REPTILIA.	
Pelagosaurus Moorei, E. Deslongchamps, MS. 1876. [a nearly complete skeleton]	U. Lias, Ilminster.
PISCES.	
Leptolepis constrictus, P. M. G. Egerton, Mem. Geol. Surv. dec. vi, pl. ix.; C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 183; A. S. Woodward and C. D. Sherborn, Brit. Foss. Vert, p. 114. [2 nearly complete bodies showing the skeleton]	U. Lias, Ilminster.
CEPHALOPODA.	
Belemnites Ilminsterensis, J. Phillips, Pal. Soc. British Belemnitidæ, pt. iii (1867), p. 64, pl. xii, f. 30. [several specimens]	U. Lias, Ilminster.
Belemnites minutus, J. Phillips, Pal. Soc. British Belemnitidæ, pt. iv (1869), p. 89, diagram No. 24. [3 specimens]	U. Lias, Ilminster.
Belemnites quadricanaliculatus var. obsoletus, J. Phillips, Pal. Soc. British Belemnitidæ, pt. iv (1869), p. 89, diagram No. 25. [1 specimen]	U. Lias, Ilminster.
Belemnites sulcistylus, J. Phillips, Pal. Soc. British Belemnitidæ, pt. iii (1867), p. 83, pl. xix, f. 49. [1 specimen]	Inferior Oolite (Sands), Nailsworth.

GASTEROPODA.	STRATA AND LOCALITIES.
***Actæon depressus**, C. Moore, Quart. Journ. Geol. Soc. vol. xxvi, p. 256, pl. x, f. 20. [1 specimen] ...	Secondary, Wollumbilla (Australia).
Actæonina Ilminsterensis, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 198, pl. v, ff. 25, 26; R. Tate, Yorkshire Lias, p. 355. [2 specimens]	M. Lias, Ilminster.
"**Alaria**" **angulata**, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 197, pl. iv, f. 4. [1 specimen] ...	U. Lias, Compton.
"**Alaria**" **coronata**, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 198, pl. iv, f. 3. [1 specimen, fragmentary]	U. Lias, Ilminster.
"**Alaria**" **fusiformis**, C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 542, pl. xiv, f. 25. [1 specimen in matrix]	L. Lias, Brocastle.
"**Alaria**" **rudis**, C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 542, pl. xiv, f. 24.—? Amberleya. [1 specimen in matrix]	L. Lias, Brocastle.
Alaria unispinosa, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 197, pl. iv, ff. 1, 2. [5 specimens in shale]	U. Lias, Ilminster.
"**Amberleya**" "**apicalis**," C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 555, pl. xvi, ff. 7—10.—? Syn. Amb. turrita Moore. [2 specimens, one of them young]	L. Lias, Brocastle.
Amberleya grandis, C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 555, pl. xvi, f. 6. [1 specimen] ...	L. Lias, Brocastle.
Amberleya Lycetti, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 197, pl. vi, f. 6. [1 specimen in matrix]	U. Lias, Compton.
"**Amberleya**" "**turrita**," C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 556, pl xvi, f. 19.—? Syn. Amb. apicalis, Moore, young state. [1 specimen in matrix]	Liassic Vein of Holwell.
Cerithium asperulum, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 198, pl. iv, f. 5 [1 specimen] ...	M. Lias, Ilminster.
Cerithium Camertonense, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 200, pl. iv, f. 9. [1 specimen in matrix]	M. Lias, Camerton.
"**Cerithium**" **constrictum**, C. Moore, Quart. Journ. Geol. Soc. vol. xvii, p. 508, pl. xvi, f. 13.—Turritella, A. von Dittmar, "Die Contorta Zone" p. 142.—Syn. C. decoratum, Moore sp., A. von Dittmar, loc. cit.. [1 imperfect specimen in matrix]	Rhætic, Beer Crowcombe.
Cerithium coronatum, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 199, pl. iv, f. 14. [2 specimens.]..	U. Lias, Ilminster.
"**Cerithium**" **cylindricum**, C. Moore, Quart. Journ. Geol. Soc. vol. xvii, p. 508, pl. xvi, f. 15.—Turritella, A. von Dittmar, "Die Contorta Zone" p. 141. [1 imperfect specimen in matrix] ...	Rhætic, Beer Crowcombe.
"**Cerithium**" "**decoratum**," C. Moore, Quart. Journ. Geol. Soc. vol. xvii, p. 508, pl. xvi, f. 14.—Syn. of Turritella (C.) constricta, Moore sp., A. von Dittmar "Die Contorta Zone" p. 142. [1 specimen in matrix]	Rhætic, Beer Crowcombe.
Cerithium gradatum, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 200, pl. iv, f. 10. [1 specimen, imperfect and restored in fig.]	U. Lias, Ilminster.

GASTEROPODA—*continued.*	STRATA AND LOCALITIES.
Cerithium Ilminsterense, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 200, pl. iv, f. 12; E. Wilson, Geol. Mag. dec. iii, vol. vi (1889), p. 302. [1 specimen]	U. Lias, Ilminster.
Cerithium liassicum, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 201, pl. iv, ff. 16, 17; R. Tate, Yorkshire Lias, p. 351. [2 specimens.]	M. Lias, Ilminster.
Cerithium minor, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 199, pl. iv, f. 6. [1 specimen] ...	U. Lias, Ilminster.
Cerithium nodulosum, C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 543, pl. xiv, f. 9. [1 specimen incomplete]	L. Lias, Shepton Mallet.
Cerithium pentacostæ, C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 542, pl. xiv, f. 13. [1 specimen]	L. Lias, Brocastle.
"Cerithium" planicostatum, C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 542, pl. xiv, f. 10. [1 specimen in matrix]	L. Lias, Brocastle.
"Cerithium" planum, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 199, pl. iv, f. 7. [1 specimen] ...	U. Lias, Compton.
"Cerithium" pyramidale, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 201, pl. iv, f. 8. [2 specimens, incomplete]	M. Lias, Ilminster.
"Cerithium" "Rhæticum," C. Moore, Quart. Journ. Geol. Soc. vol. xvii, p. 508, pl. xvi, f. 16.—Syn. of Turritella (C.) cylindrica, Moore sp., A. von Dittmar, "Die Contorta Zone," p. 141. [1 imperfect specimen in matrix]	Rhætic, Beer Crowcombe.
Cerithium spiratum, C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 543, pl. xiv, f. 12; R. Tate, Yorkshire Lias, p. 350. [1 specimen]	L. Lias, Brocastle.
Cerithium sublineatum, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 200, pl. iv, f. 11.—? Syn. Chemnitzia semitecta, R. Tate, Yorkshire Lias, p. 353, pl. ix, f. 23. [1 specimen, imperfect]	U. Lias, Compton.
Chemnitzia "nitida," C. Moore (non Lycett), Quart. Journ. Geol. Soc. vol. xvii, p. 510, pl. xvi, f. 11.—Syn. of Ch. granum, A. von Dittmar, "Die Contorta Zone," p. 140. [1 specimen in matrix]	Rhætic, Beer Crowcombe.
"Chiton" radiatum, C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 543, pl. xvi, ff. 25, 26.—Operculum of Neritopsis, Dumortier Dépôts Jurass. Bass. Rhône, Lias inf., p. 134. [1 specimen] ...	L. Lias, Brocastle.
"Chiton" Rhæticum, C. Moore, Quart. Journ. Geol. Soc. vol. xvii, p. 511, pl. xvi, ff. 28, 29. [2 specimens]	Rhætic, Vallis near Frome.
"Cylindrites" elongatus, C. Moore (non Phillips), Quart. Journ. Geol. Soc. vol. xvii, p. 509, pl. xvi, f. 20; A. von Dittmar, "Die Contorta Zone," p. 148.—Actæonina, Oppel and Süss. Æquiv. kössen, Schichten, Sitzb. k. k. Akad. Wissen. vol. xxi, p. 8, pl. i, f. 1; R. Etheridge, Trans. Cardiff Nat. Soc., vol. iii (1870-71), pt. ii, p. 61, pl. i, f. 18. (Figured as Cylindrites.)—Syn. "Oliva alpina," Gümbel, Geogn. Beschr. v, Bayern. p. 409. [1 specimen in matrix] ...	Rhætic, Beer Crowcombe.
"Cylindrites" fusiformis, C. Moore, Quart. Journ. Geol. Soc. vol. xvii, p. 509, pl. xvi, f. 18; A. von Dittmar, "Die Contorta Zone," p. 149.—Actæonina, R. Etheridge, Trans. Cardiff Nat. Soc. vol. iii (1870-71), pt. ii, p. 61, pl. i, f. 16. (Figured as Cylindrites.) [1 specimen in matrix]	Rhætic, Beer Crowcombe.

GASTEROPODA—*continued.*	STRATA AND LOCATITIES.
" **Cylindrites** " **ovalis**, C. Moore, Quart. Journ. Geol. Soc. vol. xvii, p. 509, pl. xvi, f. 19; A. von Dittmar, "Die Contorta-Zone," p. 149.—Actæonina, R. Etheridge, Trans. Cardiff Nat. Soc. vol. iii, (1870-71), pt. ii, pl. i, f. 17. (Figured by mistake as Natica Oppeli.) [1 specimen in matrix]	Rhætic, Beer Crowcombe.
" **Cylindrites** " **oviformis**, C. Moore, Quart. Journ. Geol. Soc. vol. xvii, p. 509, pl. xvi, f. 21; A. von Dittmar, "Die Contorta Zone," p. 148.—Actæonina, R. Etheridge, Trans. Cardiff Nat. Soc. vol. iii (1870-71), pt. ii, p. 61, pl. i, f. 19. (Figured by mistake as Cylindrites ovalis.) [1 specimen]	Rhætic, Beer Crowcombe.
" **Cylindrites** " **Whitfieldii**, C. Moore, Proc. Som. Nat. Hist. Soc., vol xiii, p. 198, pl. v, f. 27—Actæonina, R. Tate, Quart. Journ. Geol. Soc. vol xxxi, p. 505. [1 specimen]	M. Lias, Ilminster.
Discohelix cornucopiæ, C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 551, pl. xvi, ff. 1—3. [2 specimens]	L. Lias, Brocastle.
Discohelix " **Dunkeri**," C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 201, pl. v, ff. 28, 29 ..	U. Lias, Compton.
Discohelix fimbriatus, C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 552, pl. xvi, ff. 4, 5. [1 specimen in matrix]	L. Lias, Brocastle.
" **Fusus** " **Jenynsii**, C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 545, pl. xiv, ff. 6, 7. [several specimens, 1 figured]	L. Lias, Brocastle.
" **Fusus** " **Terquemi**, C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 544, pl. xiv, f. 8. [1 specimen] ...	L. Lias, Brocastle.
" **Helix** " **Dawsoni**, C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 545, pl. xv, ff. 1, 2. [1 specimen] ...	L. Lias, Charterhouse Lead mine.
Littorina circularis, C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 545. pl. xiv, ff. 15, 16. [several specimens]	L Lias, Brocastle.
Littorina ovalis, C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 545, pl. xiv, ff. 17, 18. [2 specimens in matrix]	L. Lias, Brocastle.
" **Melania** " **acuta**, C. Moore. Quart. Journ. Geol. Soc. vol. xxiii, p. 546, pl. xiv, ff. 20, 21. [2 specimens free, 1 in matrix]	L. Lias, Brocastle.
" **Melania** " **Dunravenensis**, C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 546, pl. xiv, f. 19. [1 specimen in matrix]	L. Lias, Dunraven.
" **Melania** " **nodulo-carinata**, C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 546, pl. xv, f. 18. [1 specimen in matrix]	L. Lias, Southerndown
Natica Oppelii, C. Moore, Quart. Journ. Geol. Soc. vol. xvii, p. 510, pl. xvi, f. 17; A. von Dittmar, "Die Contorta Zone," p. 139; R. Etheridge, Trans. Cardiff Nat. Soc. vol. iii (1870-71), pt. ii, p. 61. [1 specimen showing spiral colour bands]	Rhætic, Beer Crowcombe.
" **Nerinæa** " **acuminata**, C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 546, pl. xiv, f. 22. [1 specimen]...	L. Lias, Brocastle.
" **Nerinæa** " " **liassica**," C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 203, pl. vi, f. 30.—Cerithium subliassicum, Hudleston and Wilson M.S. [1 specimen]	M. Lias, Ilminster.

GASTEROPODA—*continued.*	STRATA AND LOCALITIES.
" **Nerinæa** " **rudis**, C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 547, pl. xiv, f. 23. [1 imperfect specimen in matrix]	L. Lias, Brocastle.
Neritopsis cancellatus, C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 548, pl. xv, f. 20. [several specimens, 1 figured]	L. Lias, Brocastle.
Neritopsis "Spekei," C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 202, pl. v, f. 11.—? Syn. of N. Philea, D'Orbigny, Pal. Franç. Terr. Jur. vol. ii, p. 222. [1 specimen]	U. Lias, Kingston.
Neritopsis transversa, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 203, pl. v, ff. 9, 10. [1 specimen with shell, 1 cast]	U. Lias, Ilminster.
Onustus "spinosus," C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 203, pl. iv, f. 21.—Syn. of O. (Trochus) heliacus, D'Orbigny, Pal. Franç. Terr. Jur. vol. ii, p. 269. [1 specimen]	U. Lias, Compton.
Patella crassicosta, Tate and Moore, British Lias Gasteropoda,† pl. i, ff. 16a, 16b. [1 cast in matrix]	L. Lias, Sutton.
Patella ornata, C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 548, pl. xv, f. 13. [2 specimens]	L. Lias, Brocastle.
Pitonnillus "turbinatus," C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 204, pl. v, ff. 16, 17.—Syn. of P. conicus, D'Orb, sp., R. Tate, Quart. Journ. Geol. Soc. vol. xxxi, p. 505. [1 specimen]	M. Lias, Camerton.
" **Planorbis** " **Mendipensis**, C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 548, pl. xv, f. 10. [1 specimen]	L. Lias, Charterhouse Lead mine.
Pleuratella prima, C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 549, pl. xiv, ff. 1 – 3. [2 specimens, 1 in matrix, 1 free]	L. Lias, Brocastle.
Pleurotomaria Comptonensis, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 203, pl. v, f. 15. [1 specimen]	U. Lias, Compton.
" **Pleurotomaria** " **"costulatum,"** C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 205, pl. v, ff. 12, 13.—Syn. of Turbo rugifera, Moore sp., E. Wilson, Geol. Mag. dec. iii, vol vi. (1889), p. 303. [1 specimen]	M. Lias, Ilminster.
Pleurotomaria Mendipensis, C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 550, pl. xvi, f. 24. [1 specimen]	L. Lias, Charterhouse Lead mine.
Pterocheilos primus, C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 549, pl. xiv, ff. 4, 5. [1 specimen]	L. Lias, Brocastle.
Purpurina ornatissima, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 205, pl. v, ff. 20, 21. [1 specimen]	M. Lias, Ilminster.
" **Pyrula** " **Liassica**, C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 550, pl. xvi, f. 30. [1 specimen in matrix]	L. Lias, Brocastle.
Rimula elegans, C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 551, pl. xv, ff. 16, 17	L. Lias, Brocastle.
Rimula punctata, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 206, pl. v, ff. 30, 31. [1 specimen]	U. Lias, Compton.
***Rissoina Australis**, C. Moore, Quart. Journ. Geol. Soc. vol. xxvi, p. 257, pl. x, f. 23. [1 specimen]	Secondary, W. Australia.
Solarium crenulatum, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 206, pl. iv, ff. 19, 20. [1 specimen in matrix]	M. Lias, Ilminster.

GASTEROPODA—*continued.*	STRATA AND LOCALITIES.
x "**Straparollus**" **Suessi**, C. Moore, Quart. Journ. Geol. Soc. vol. xvii, p. 511, pl. xv, ff. 2—5.—Euomphalus, A. von Dittmar, "Die Contorta Zone," p. 147.—Discohelix, Hudleston and Wilson M.S. [1 specimen]	Rhætic, Beer Crowcombe.
Trochotoma "**Brocastellensis,**" C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 552, pl. xv, f. 29.—? Syn. of Tr. Lycettii, Moore, and Tr. sinistrosus, Terquem. [1 specimen in matrix] ...	L. Lias, Brocastle.
Trochus apicalis, C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 553, pl. xvi, ff. 20—22. [1 specimen]...	L. Lias, Brocastle.
"**Trochus**" "**carinatus,**" C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 207, pl. iv, ff. 24, 25.—Syn. of Pleurotomaria helicinoides, Römer sp., E. Wilson, Geol. Mag. dec. iii, vol. vi (1889), p. 304. [1 specimen]	M. Lias, Ilminster.
"**Trochus**" "**concinnus,**" C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 207, pl. iv, ff. 28, 29.—? Syn. of Eucyclus (Trochus) Gaudryanus, D'Orb. sp., R. Tate, Quart. Journ. Geol. Soc. vol. xxxi, p. 505.—Amberleya Gaudryana. [2 specimens]	M. Lias, Camerton.
"**Trochus**" "**Deslongchampsii,**" C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 553, pl. xvi, f. 15. [1 specimen]	L. Lias, Brocastle.
Trochus Elizæ (Tr. Mariæ, Moore non D'Orbigny), C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 554, pl. xvi, ff. 16, 17. [1 specimen]	L. Lias, Brocastle.
Trochus flexicostatus, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 206, pl. v, ff. 1, 2. [1 specimen]	M. Lias, Ilminster.
"**Trochus**" **Langanensis**, C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 553, pl. xvi, f. 18. [1 specimen]	L. Lias, Langan.
Trochus lineatus, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 207, pl. v, ff. 3, 4. [1 specimen] ...	M. Lias, Ilminster.
Trochus mammillaris, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 208, pl. v, ff. 7, 8. [1 specimen]	M. Lias, Camerton.
Trochus nodulatus, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 208, pl. iv, ff. 26, 27. [1 specimen]	M. Lias, Ilminster.
Trochus "**nudus,**" C. Moore (non Münster), Quart. Journ. Geol. Soc. vol. xvii, p. 510, pl. xvi, f. 22.—Syn. of Tr. Waltoni, Moore sp., A. von Dittmar, "Die Contorta Zone," p. 146. [1 specimen in matrix]	Rhætic, Beer Crowcombe.
Trochus Pethertonensis, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 207, pl. v, ff. 5, 6. [1 specimen]	M. Lias, Ilminster.
Trochus similis, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 206, pl. iv, ff. 22, 23. [1 specimen in matrix]	M. Lias, Ilminster.
Trochus "**Waltonii,**" C. Moore, Quart. Journ. Geol. Soc. vol. xvii, p. 510, pl. xvi, f. 23. Syn. Tr. nudus, Moore sp., A. von Dittmar, "Die Contorta Zone," p. 146. [1 specimen in matrix] ...	Rhætic, Beer Crowcombe.
***Turbo australis**, C. Moore, Quart. Journ. Geol. Soc. vol. xxvi, p. 257, pl. x, ff. 17, 18. [1 specimen] ...	Secondary, W. Australia.
Turbo bifurcatus, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 209, pl. vi, ff. 27, 28. [2 specimens in matrix]	L. Lias, Camerton.

GASTEROPODA—*continued.*	STRATA AND LOCALITIES.
Turbo Brocastellensis, C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 555, pl. xvi, f. 13. [1 specimen]...	L. Lias, Brocastle.
" **Turbo** " **bullatus**, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 211, pl. vi, ff. 15, 16. [1 specimen]...	M. Lias, Camerton.
" **Turbo** " **constrictus**, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 210, pl. vi, f. 12. [1 specimen] ...	U. Lias, Ilminster.
Turbo " **coronatus**," C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 209, pl. vi, ff. 21, 22, 22.* Syn. of Turbo rugiferus, Moore sp., E. Wilson, Geol. Mag. dec. iii, vol. vi, (1889), p. 303. [1 specimen]	M. Lias, Ilminster.
Turbo elegantissima, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 211, pl. vi, ff. 19, 20. [2 specimens]	M. Lias, Ilminster.
" **Turbo** " " **Jonesei**," C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 210, pl. vi, f. 11. Syn. of Amberleya (Turbo) ornatus Sow. Hudleston and Wilson, M.S. Catalogue (1892). [2 specimens] ...	U. Lias, Compton.
" **Turbo** " **linctus**, C. Moore, Proc Som. Nat. Hist. Soc. vol. xiii, p. 219, name changed in Corrigenda et Addenda from Turbo nudus, C. Moore (non Martin), vol. *cit.* p. 208, pl. vi, ff. 25, 26. [2 specimens]	M. Lias, Ilminster.
Turbo " **lineatus**," C. Moore (non Martin), Proc. Som. Nat. Hist. Soc. vol. xiii, p. 211, pl. vi, ff. 13, 14. ? Syn of Turbo (Trochus) cyclostomoides, Koch and Dunker. [1 specimen]	U. Lias, Ilminster.
" **Turbo** " **polita**, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 211, pl. vi, ff. 17, 18. ? Eucyclus, R. Tate, Quart. Journ. Geol. Soc., vol. xxxi, p. 505. ? Syn. of Amberleya (Tr.) Gaudryana, D'Orb. sp., Hudleston and Wilson MS., Catalogue (1892). [1 specimen]	M. Lias, Camerton.
Turbo reticulatus, C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 556, pl. xvi, ff. 11, 12; R. Tate, Yorkshire Lias, p. 344. [2 specimens]	L. Lias, Brocastle.
Turbo rugiferus, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 209, pl. vi, ff. 23, 24; E. Wilson, Geol. Mag. dec. iii, vol. vi, (1889), p. 303. [1 specimen]	M. Lias, Ilminster.
Turbo Rutteri, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 210, pl. vi, f. 29. [1 specimen in matrix]	M. Lias, Ilminster.
Turbo varians, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 209, pl. vi, ff. 9, 10. [1 specimen] ...	U. Lias, Ilminster.
" **Turritella** " " **anomala**," C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 212, pl. iv, f. 18. Chemnitzia, R. Tate, Quart. Journ. Geol. Soc., vol. xxxi, p. 505. ? Syn. of " Chemnitzia " undulata, Benz, and of " Turritella " similis, Moore. [1 specimen in matrix]	M. Lias, Camerton.
" **Turritella** " **Howsei**, C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 556, pl. xiv, f. 14. [1 specimen] ...	L. Lias, Charterhouse Lead mine.
" **Turritella** " " **similis**," C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 212, pl. iv, f. 13. Syn. of " Chemnitzia " undulata, Benz, and of " Turritella " anomala, Moore. [1 specimen in matrix]	M. Lias, Ilminster.

GASTEROPODA—*continued.*	STRATA AND LOCALITIES.
"Valvata" anomala, C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 556, pl. xv, ff. 7—9. [1 specimen] ...	L. Lias, Charterhouse Lead mine.
"Valvata" pygmæa, C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 557, pl. xv, ff. 5, 6. [1 specimen] ...	L. Lias, Charterhouse Lead mine.
"Vertigo" Murchisonæ, C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 557, pl. xv, ff. 11, 12. [1 specimen]	L. Lias, Charterhouse Lead mine.
SCAPHOPODA.	
Dentalium "gracile," C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 202, pl. v, f. 23. Syn. of D. elongatum, Münster sp., R. Tate, Quart. Journ. Geol. Soc. vol. xxxi, p. 504. [1 specimen]	M. Lias, Camerton.
Dentalium liassicum, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 202, pl. v, f. 24. [1 specimen]	M. Lias, Camerton.
Dentalium "trigonalis," C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 202, pl. v, f. 22. Syn of D. compressum, D'Orb. sp., R. Tate, Quart. Journ. Geol. Soc. vol. xxxi, p. 504. [1 specimen]	M. Lias, Camerton.
PELECYPODA.	
Arca interrupta, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 213, pl. vii, f. 13. [left valve] ...	U. Lias, Ilminster.
Arca "Lycettii," C. Moore, Quart. Journ. Geol. Soc. vol. xvii, p. 501, pl. xvi, f. 7. Syn. of Macrodon (Cucullæa) hettangiensis, Terquem sp., R. Tate, Yorkshire Lias, p. 379. [right valve in matrix]	Rhætic, Beer Crowcombe.
Astarte Camertonensis, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 213, pl. vii, f. 21. [right valve]	M. Lias, Camerton.
***Astarte Cliftoni,** C. Moore, Quart. Journ. Geol. Soc. vol. xxvi, p. 249, pl. xiii, f. 10. [left valve] ...	Secondary, Greenough River, W. Australia.
Astarte duplicata, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 212, pl. vii, f. 18. [complete shell]...	M. Lias, Ilminster.
Astarte "Oppeli," C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 213, pl. vii, f. 20. Syn. of A. striato-sulcata, Münster sp., R. Tate, Quart. Journ. Geol. Soc. vol. xxxi, p. 506. [left valve] ..	M. Lias, Camerton.
Astarte parallela, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 213, pl. vii, f. 19. [complete shell] ...	U. Lias, Ilminster.
Avicula imbricata, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 214, pl. vii, ff. 23, 24. [4 specimens, right and left valves]...	U. Lias, Ilminster.
Avicula solitaria, C. Moore, Quart. Journ. Geol. Soc. vol. xvii, p. 499, pl. xv, f. 11; A. von Dittmar, "Die Contorta Zone," p. 164. [1 specimen in matrix]	Rhætic, Beer Crowcombe.
"Axinus," concentricus, C. Moore, Quart. Journ. Geol. Soc. vol. xvii, p. 503, pl. xv, ff. 19—21. Schizodus, A. von Dittmar, "Die Contorta Zone," p. 174. [a right and a left valve in matrix] ...	Rhætic, Beer Crowcombe.

PELECYPODA—*continued.*	STRATA AND LOCALITIES.
"**Axinus**" **depressus**, C. Moore, Quart. Journ. Geol. Soc. vol. xvii, p. 503, pl. xv, f. 17. Schizodus, A. von Dittmar, "Die Contorta Zone," p. 175. [right valve in matrix]	Rhætic, Beer Crowcombe.
"**Axinus**" **elongatus**, C. Moore (non Gümbel) Quart. Journ. Geol. Soc. vol. xvii, p. 503, pl. xv, f. 18. Schizodus, A. von Dittmar, "Die Contorta Zone," p. 174. [1 double valve] ...	Rhætic, Beer Crowcombe.
Cardita "liasiana," C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 214, pl. vii, f. 9. Syn. of C. multicostata, Phillips sp., R. Tate, Yorkshire Lias, p. 388. [1 right valve]	M. Lias, Ilminster.
Corbula Somersetensis, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 214, pl. vii, f. 17. [1 left valve]	U. Lias, Ilminster.
Cucullæa bilineata, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 214, pl. vii, f. 4. [1 right valve] ...	M. Lias, Ilminster.
***Cucullæa inflata**, C. Moore, Quart. Journ. Geol. Soc. vol. xxvi, p. 250, pl. xiv, ff. 1, 2. [2 valves with umbones fairly perfect]	Secondary, Greenough River, W. Australia.
***Cucullæa semistriata**, C. Moore, Quart. Journ. Geol. Soc. vol. xxvi, p. 250, pl. xiv, f, 3. [1 left valve] ...	Secondary, Greenough River, W. Australia.
Cypricardia "intermedia," C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 216, pl. vii, f. 5. ? Syn. of Cyp. (Cardium) cucullata, Münster sp., R. Tate, Yorkshire Lias, p. 391. [1 double valve]	M. Lias, Ilminster.
Cypricardia "pellucida," C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 215, pl. vii, f. 6. Syn. of Cyp. (Cardium) cucullata Münster sp., R. Tate, Yorkshire Lias, p. 391. [1 double valve] ...	M. Lias, Ilminster.
Cypricardia Winwoodii, C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 541, pl. xvi, f. 27. [1 right valve in matrix]	L. Lias, Sutton.
Gervillia incurva, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 216, pl. vii, f. 12. [4 single valves in matrix]	U. Lias, Ilminster.
Gervillia oblonga, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 216, pl. vii, f. 11. [1 left valve] ...	U. Lias, Ilminster.
Gervillia "ornata," C. Moore, Quart. Journ. Geol. Soc. vol. xvii, p. 500, pl. xv, f. 8. Syn. of G. Faberi, Winkler, sp., A. von Dittmar, "Die Contorta Zone," p. 165. [1 left valve in matrix] ..	Rhætic, Beer Crowcombe.
Hippopodium ovalis, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 216, pl. vii, ff. 1, 2. [1 left valve]	M. Lias, Ilminster.
Inoceramus plicatus, C, Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 217, pl. vii, f. 14. [1 left valve]...	U. Lias, Ilminster.
"**Isocardia**" "**liassica,**" C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 217, pl. vii, f. 3. Syn. of Ceromya (Venus) petricosa, Simpson sp., R. Tate, Yorkshire Lias, p. 408. [1 double valve]	M. Lias, Ilminster.
Leda Titei, C. Moore, Quart. Journ. Geol. Soc. vol. xvii, p. 504, pl. xv, f. 25. A von Dittmar, "Die Contorta Zone," p. 171. [1 double valve]	Rhætic, Beer Crowcombe.
Modiola, dorso-plicata, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 217, pl. vii, f. 8. [1 right valve]	U. Lias, Ilminster.
Modiola "ornata," C. Moore (non Münster), Proc. Som. Nat. Hist. Soc. vol. xiii, p. 217, pl. vii, f. 7. Syn. of Modiola subcancellata, Buvignier sp., R. Tate, Yorkshire Lias, p. 378. [1 left valve]	M. Lias, Ilminster.

PELECYPODA—*continued.*	STRATA AND LOCALITIES.
***Myacites Sanfordii**, C. Moore, Quart. Journ. Geol. Soc. vol. xxvi, p. 253, pl. xiii, f. 9. [2 left valves]	Inf. Oolite, W. Australia.
Myacites striato-granulata, C. Moore, Quart. Journ. Geol. Soc. vol. xvii, p. 506, pl. xvi, f. 1; A. von Dittmar, "Die Contorta Zone,' p. 188. [1 right valve in matrix]	Rhætic, Beer Crowcombe.
Opis curvirostris, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 218, pl. vii, f. 22. [1 left valve]	M. Lias, Ilminster.
Ostrea fimbriata, C. Moore, Quart. Journ. Geol. Soc. vol. xvii, p. 501, pl. xvi, f. 24; A. von Dittmar, "Die Contorta Zone," p. 155. [1 imperfect specimen]	Rhætic, Vallis, Frome.
Perna dubia, C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 218, pl. vii, f. 10. [2 detached valves in matrix]	U. Lias, Ilminster.
Pleurophorus angulatus, C. Moore, Quart. Journ. Geol. Soc. vol. xvii, p. 504, pl. xv, ff. 12, 13; A. von Dittmar, "Die Contorta Zone," p. 180. [a right and a left valve in matrix]	Rhætic, Beer Crowcombe.
" **Pleurophorus** " "**elongatus**," C. Moore, Quart. Journ. Geol. Soc. vol. xvii. p. 503, pl. xv, ff. 14, 15. Syn. of Cypricardia Marcignyana, Martin sp., A. von Dittmar, "Die Contorta Zone," p. 179. [a right and a left valve in matrix]	Rhætic, Beer Crowcombe.
Pteromya Crowcombeia, C. Moore, Quart. Journ. Geol. Soc. vol. xvii, p. 506, pl. xv, ff. 22, 23; R. Tate, Yorkshire Lias, p. 406; A. von Dittmar, "Die Contorta Zone," p. 185. [1 right valve and 1 left valve in matrix]	Rhætic, Beer Crowcombe.
Pteromya simplex, C. Moore, Quart. Journ. Geol. Soc. vol. xvii, p. 506, pl. xv, f. 24; A. von Dittmar, "Die Contorta Zone," p. 185. [1 left valve in matrix]	Rhætic, Beer Crowcombe.
***Thracia Wilsoni**, C. Moore, Quart. Journ. Geol. Soc. vol. xxvi, p. 254, pl. xiv, f. 8. [2 left valves]	Secondary, Amby River and Bungesworgorai Creek, Australia.
***Trigonia Moorei**, Lycett sp., C. Moore, Quart. Journ. Geol. Soc. vol. xxvi, p. 254, pl. xiv, ff. 9, 10. [right and left valves]	Secondary, W. Australia.
Unicardium "**globosum**," C. Moore (non Agassiz), Proc. Som. Nat. Hist. Soc. vol. xiii, p. 219, pl. vii, f. 15. Syn. of U. subglobosum, R. Tate, Yorkshire Lias, p. 396. [right valve in matrix]	M. Lias, S. Petherton.
BRACHIOPODA.	
***Discina apicalis**, C. Moore, Quart. Journ. Geol. Soc. vol. xxvi, p. 244, pl. x, f. 13. [1 imperfect specimen of stone]	Secondary, Wollumbilla, Queensland.
Discina Davidsoni, C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 540, pl. xvi, f. 29; T. Davidson, Pal. Soc. Brit. Foss. Brach. vol. iv, p. 84, pl. x, ff. 11, 11a. [1 specimen on block of stone (1861), with Cerithium nodulosum, Moore.]	L. Lias, Bedminster Down.

BRACHIOPODA—*continued.*	STRATA AND LOCALITIES.
Discina Dundriensis, C. Moore, The Geologist, vol. iv, p. 98, pl. ii, f. 15; T. Davidson, Pal. Soc. Brit. Foss. Brach. vol. iv, p. 84, pl. x, ff. 13, 13a. [1 specimen]	Inf. Oolite, Dundry.
Rhynchonella Bouchardii, T. Davidson, Pal. Soc. Brit. Foss. Brach, vol. 1, pt. iii, p. 82, pl. xv, ff. 3, 4. [2 specimens]	U. Lias, Ilminster.
" **Rhynchonella** " ? **coronata**, C. Moore, The Geologist, vol. iv (1861), p. 191, pl. ii, ff. 23—25. ? Rhynchonella, T. Davidson, Pal. Soc. Brit. Foss. Brach. vol. iv, p. 218, pl. xxvii, f. 13. [3 specimens]	U. Lias, Ilminster.
Rhynchonella Lopensis, C. Moore, Proc. Som. Nat. Hist. Soc. vol. v (1855), p. 114. pl. i, ff. 9, 10; ? T. Davidson, Pal. Soc. Brit. Foss. Brach. vol. iv, p. 217, pl. xxvii, ff. 8, 9. Syn. Rhyn. triangularis, T. Davidson, (non Wahlenberg). op. cit. vol. i, appendix, p. 30. [2 specimens]	Inf. Oolite, Lopen, near Ilminster.
Rhynchonella Moorei, T. Davidson, Pal. Soc. Brit. Foss. Brach. vol. i, pt. iii, p. 82, pl. xv, ff. 11, 12. [4 specimens]	U. Lias, Ilminster.
Rhynchonella (Terebratula) pygmæa, J. Morris, Ann. Mag. Nat. Hist. vol. xx (1847), p. 256, pl. xix, ff. 3a, b; T. Davidson, Pal. Soc. Brit. Foss. Brach. vol. i, pt. iii, p. 57, pl. xiii, ff. 16a—c; Rhynchonella, T. Davidson, vol. cit. appendix, p. 19. [3 specimens]	U. Lias, Ilminster.
Rhynchonella subconcinna, T. Davidson, Pal. Soc. Brit. Foss. Brach. vol. i, pt. iii, p. 90, pl. xvii, f. 17. [1 specimen]	M. Lias, Ilminster.
" **Spirifera** " **minima**, C. Moore, The Geologist, vol. iv (1861), p. 190, pl. ii, ff. 19, 20. Spiriferina, T. Davidson, Pal. Soc. Brit. Foss. Brach. vol. iv, p. 103, pl. xi, f. 17 [8 specimens]	Inf. Oolite, Dundry.
" **Spirifera** " **Munsterii**, T. Davidson, Pal. Soc. Brit. Foss. Brach. vol. i, pt. iii, p. 26, pl. iii, ff. 4—6. Spiriferina, T. Davidson, op. cit. vol. iv, p. 102. [3 specimens]	M. Lias, Ilminster.
" **Spirifera** " **oolitica**, C. Moore, Proc. Som. Nat. Hist. Soc. vol. v (1855), p. 115, pl. iii, ff. 13, 14; T. Davidson, Pal. Soc. Brit. Foss. Brach. Appendix to vol. i, p. 30. ? Spiriferina, T. Davidson, op. cit. vol. iv, p. 102, pl. xi, ff. 13—15. [2 specimens]	Inf. Oolite, Dundry.
Terebratella Buckmanni, C. Moore, The Geologist, vol. iii (1860), p. 441, pl. xiii, ff. 1—5; T. Davidson, Pal. Soc. Brit. Foss. Brach. vol. iv, p. 114, pl. xiv, ff. 13, 14. [several specimens, double valves and interiors]	Gt. Oolite, Hampton Rocks, near Bath.
Terebratula Edwardsii, T. Davidson, Pal. Soc. Brit. Foss. Brach. vol. i, pt. iii, p. 30, pl. vi, ff. 13—15, and vol. iv, p. 131. [4 specimens]	M. Lias. Ilminster.
" **Terebratula** " "**numismalis**," Lamarck **var. subnumismalis**, T. Davidson, Pal. Soc. Brit. Foss. Brach. vol. i, pt. iii, p. 38, pl. v, f. 10. As Waldheimia subnumismalis, T. Davidson, op. cit. vol. iv, p. 162. [1 specimen]	M. Lias, Ilminster.

BRACHIOPODA—*continued.*	STRATA AND LOCALITIES.
Terebratula "subpunctata," T. Davidson, Pal. Soc. Brit. Foss. Brach. vol. i, pt. iii, p. 46, pl. vi, ff. 8, 10, 12. As a var. of T. punctata, T. Davidson, vol. cit. appendix, p. 18. As T. punctata, T. Davidson, op. cit. vol. iv, p. 130. [6 specimens]	M. Lias, S. Petherton.
Thecidium Bouchardii, T. Davidson, Pal. Soc. Brit. Foss. Brach. vol. i, pt. iii, p. 14, pl. i, ff. 15, 16; C. Moore, Proc. Som. Nat. Hist. Soc. vol. v (1855), p. 116, pl. i, ff. 11—13; T. Davidson, op. cit. vol. iv, p. 106, pl. xiii, ff. 1—3. [4 specimens]	Inf. Oolite, Dundry.
Thecidium duplicatum, C. Moore, Proc. Som. Nat. Hist. Soc. vol. v (1855), p. 118, pl. ii, ff. 7—12; T. Davidson, Pal. Soc. Brit. Foss. Brach. Appendix to vol. i, p. 30, and vol. iv, p. 108, pl. xii, ff. 15—20. [6 specimens showing exteriors and interiors]	Inf. Oolite, Dundry.
Thecidium Forbesei, C. Moore, Proc. Som. Nat. Hist. Soc. vol v (1855), p. 120, pl. iii, ff. 8—10; T. Davidson, Pal. Soc. Brit. Foss. Brach. vol. iv, p. 109, pl. xii, ff. 6—9. [4 specimens showing exteriors and interiors]	Inf. Oolite, Dundry.
Thecidium Moorei, T. Davidson, Pal. Soc. Brit. Foss. Brach. vol. i, pt. iii, p. 13, pl. i, f. 10 and vol. iv, p. 105. [several specimens attached to a Rhync. serrata]	M. Lias, Ilminster.
Thecidum ornatum, C. Moore, The Geologist, vol. iv (1861), p. 96, pl. ii, ff 1—3; T. Davidson, Pal. Soc. Brit. Foss. Brach. vol. iv, p. 104, pl. xiii, ff. 5—9. [8 specimens showing exteriors and interiors]	Cor. Rag, Lyneham (Wilts).
Thecidium pygmæum, C. Moore, The Geologist, vol. iv (1861), p. 96, pl. ii, ff. 4—7; ? T. Davidson, Pal. Soc., Brit. Foss. Brach. vol. iv, p. 105, pl. xiii, ff. 16a—c. [9 specimens showing exteriors and interiors]	Cor. Rag, Lyneham (Wilts).
Thecidium septatum, C. Moore, Proc. Som. Nat. Hist. Soc. vol. v (1855), p. 119, pl. ii, ff. 13—16; T Davidson, Pal. Soc. Brit. Foss. Brach. Appendix to vol. i, p. 30 and vol. iv, p. 109, pl. xii, ff. 22—24. [4 specimens showing exteriors and interiors]	Inf. Oolite, Dundry.
Thecidium serratum, C. Moore, Proc. Som. Nat. Hist. Soc. vol. v (1855), p. 119, pl. iii, ff. 1—6; T. Davidson, Pal. Soc. Brit. Foss. Brach. Appendix to vol. i, p. 30 and vol. iv, p. 108, pl. xii, ff. 10—14. [6 specimens showing exteriors and interiors]	Inf. Oolite, Dundry.
Trigonosemus incertus, T. Davidson, Pal. Soc. Brit. Foss. Brach. vol. i, pt. ii, p. 31, pl. iv, f. 5. [1 specimen]	Cret. (Chloritic Marl), Chard.
Zellania Laboucherei, C. Moore, Proc. Som. Nat. Hist. Soc. vol. v (1855), p. 113, pl. i, ff. 4, 5; T. Davidson, Pal. Soc. Brit. Foss. Brach. Appendix to vol. i, p. 29 and vol. iv, p. 112, pl. xi, ff. 20, 21. [2 specimens]	L. Lias, Brocastle— Inf. Oolite, Dundry.
Zellania oolitica, C. Moore, The Geologist, vol. iii (1860), p. 444, pl. xiii, ff. 18—20; T. Davidson, Pal. Soc. Brit. Foss. Brach. vol. iv, p. 113, pl. xi, f. 28. [3 specimens]	Inf. Oolite, Dundry.

	STRATA AND LOCALITIES.
## CRUSTACEA.	
Eryon Moorei, H. Woodward, Quart. Journ. Geol. Soc. vol. xxii, p. 499, pl. xxv, f. 3 and Cat. Brit Foss. Crustacea, 1877, p. 11; C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 187. [1 nearly complete specimen]	U. Lias, Ilminster.
Pollicipes rhomboidalis, C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 539, pl. xvi, f. 31. [1 fragment]	L. Lias, Shepton Mallet.
## ACTINOZOA.	
Astrocænia costata, P. M. Duncan, Pal. Soc. Brit. Foss. Corals, 2nd ser. pt. iv, p. 21, pl. ix, ff. 15—17. [specimen in matrix]	L. Lias, Brocastle.
Astrocænia dendroidea, P. M. Duncan, Pal. Soc. Brit. Foss. Corals, 2nd ser. pt. iv, p. 22, pl. ix, ff. 9, 10. [specimen in matrix]	L. Lias, Brocastle.
Astrocænia favoidea, P. M. Duncan, Pal. Soc. Brit. Foss. Corals, 2nd ser. pt. iv, p. 21, pl. ix, ff. 12—14. [two specimens]	L. Lias, Brocastle.
Astrocænia gibbosa, P. M. Duncan, Pal. Soc. Brit. Foss. Corals, 2nd ser. pt. iv, p. 18, pl. iv., f. 3, pl. v, f. 12. [2 specimens in matrix]	L. Lias, Sutton Stone and Brocastle.
Astrocænia insignis, P. M. Duncan, Pal. Soc. Brit. Foss. Corals, 2nd ser. pt. iv, p. 19, pl. ix, ff. 1, 2. [specimen in matrix]	L. Lias, Brocastle.
Astrocænia minuta, P. M. Duncan, Pal. Soc. Brit. Foss. Corals, 2nd ser. pt. iv, p. 22, pl. ix, ff. 18—20. [1 specimen]	L. Lias, Brocastle.
Astrocænia pedunculata, P. M. Duncan, Pal. Soc. Brit. Foss. Corals, 2nd ser. pt. iv, p. 20, pl. v, ff. 7—9 [1 specimen]	L. Lias, Brocastle.
Astrocænia reptans, P. M. Duncan, Pal. Soc. Brit. Foss. Corals, 2nd ser. pt. iv, p. 20, pl. iv, ff. 4, 5, 15. [1 specimen]	L. Lias, Sutton Stone.
Astrocænia superba, P. M. Duncan, Pal. Soc. Brit. Foss. Corals, 2nd ser. pt. iv, p. 21, pl. ix, ff. 3—5. [1 specimen]	L. Lias, Brocastle.
Cyathocænia costata, P. M. Duncan, Pal. Soc. Brit. Foss. Corals, 2nd ser. pt. iv, p. 29. Figured under Solenastræa Reussi, pl. v, ff. 10, 11	L. Lias, Brocastle.
Cyathocænia dendroidea, P. M. Duncan, Pal. Soc. Brit. Foss. Corals, 2nd ser. pt. iv, p. 27, pl. ix, ff. 6—9. [1 specimen in matrix]	L. Lias, Brocastle.
Cyathocænia incrustans, P. M. Duncan, Pal. Soc. Brit. Foss. Corals, 2nd ser. pt. iv, p. 28, pl. iv, ff. 1, 2. [1 specimen in matrix]	L. Lias, Sutton Stone.

ACTINOZOA—*continued.*

	STRATA AND LOCALITIES.
Elysastræa Moorei, P. M. Duncan, Pal. Soc. Brit. Foss. Corals, 2nd ser. pt. iv, p. 30, pl. vi, ff. 10—15. [4 specimens]	L. Lias, Sutton Stone, Brocastle.
Isastræa globosa, P. M. Duncan, Pal. Soc. Brit. Foss. Corals, 2nd ser. pt. iv, p. 31, pl. viii, ff. 17, 18. [1 specimen]	L. Lias, Brocastle.
Montlivaltia brevis, P. M. Duncan, Pal. Soc. Brit. Foss. Corals, 2nd ser. pt. iv, p. 10, pl. viii, ff. 8, 9. [1 specimen in matrix]	L. Lias, Brocastle.
Montlivaltia Murchisoniæ, P. M. Duncan, Pal. Soc. Brit. Foss. Corals, 2nd ser. pt. iv, p. 8, pl. viii, ff. 10—12. [1 specimen in matrix]	L. Lias, Brocastle.
Montlivaltia parasitica, P. M. Duncan, Pal. Soc. Brit. Foss. Corals, 2nd ser. pt. iv, p. 9, pl. iv, ff. 13, 14. [1 specimen]	L. Lias, Sutton Stone.
Montlivaltia pedunculata, P. M. Duncan, Pal. Soc. Brit. Foss. Corals, 2nd ser. pt. iv, p. 10, pl. viii, f. 16. [1 specimen]	L. Lias, Brocastle.
Montlivaltia simplex, P. M. Duncan, Pal. Soc. Brit. Foss. Corals, 2nd ser. pt. iv, p. 9, pl. iii, ff. 16, 17. [1 specimen]	L. Lias, Brocastle.
Montlivaltia Walliæ, P. M. Duncan, Pal. Soc. Brit. Foss. Corals, 2nd ser. pt. iv, p. 7, pl. viii., ff. 5—7. [1 specimen in matrix]	L. Lias, Brocastle.
Thecosmilia affinis, P. M. Duncan, Pal. Soc. Brit. Foss. Corals, 2nd ser. pt. iv, p. 16, pl. iii, ff. 18—20. [1 specimen]	L. Lias, Brocastle.
Thecosmilia Brodiei, P. M. Duncan, Pal. Soc. Brit. Foss. Corals, 2nd ser. pt. iv, p. 13, pl. x, ff. 1—4. [specimen in matrix]	L. Lias, Brocastle.
Thecosmilia dentata, P. M. Duncan, Pal. Soc. Brit. Foss. Corals, 2nd ser. pt. iv, p. 16, pl. iii, ff. 21—23. [2 specimens in matrix]	L. Lias, Brocastle.
Thecosmilia irregularis, P. M. Duncan, Pal. Soc. Brit. Foss. Corals, 2nd ser. pt. iv, p. 15, pl. iii, ff. 1—6. [1 specimen]	L. Lias, Brocastle.
Thecosmilia plana, P. M. Duncan Pal. Soc. Brit. Foss. Corals, 2nd ser. pt. iv, p. 17, pl. iii, ff. 24, 25. [1 specimen]	L. Lias, Brocastle.
Thecosmilia serialis, P. M. Duncan, Pal. Soc. Brit. Foss. Corals, 2nd ser. pt. iv, p. 12, pl. iv, ff. 10, 11. [3 specimens]	L. Lias, Sutton Stone.
Thecosmilia Suttonensis, P. M. Duncan, Pal. Soc. Brit. Foss. Corals, 2nd ser. pt. iv, p. 11, pl. iv, ff. 7—9. [1 specimen]	L. Lias, Sutton Stone.
Thecosmilia Terquemi, P. M. Duncan, Pal. Soc. Brit. Foss. Corals, 2nd ser. pt. iv, p. 16, pl. iii, f. 7, [several specimens in matrix]	L. Lias, Brocastle.

	STRATA AND LOCALITIES.
SPONGIDÆ.	
Grantia antiqua, C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 538, pl. xvi, ff. 33, 34, [2 spiculæ] ...	L. Lias, Brocastle.
***Purisiphonia Clarkei**, Bowerbank sp., C. Moore, Quart. Journ. Geol. Soc. vol. xxvi, p. 241, pl. xvii, f. 1. [1 specimen]	Secondary, Wollumbilla Queensland.
FORAMINIFERA.	
Planularia cornucopiæ, H. B. Brady sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 226, pl. ii, ff. 28, 29	U. Lias, Ilminster.
PLANTÆ.	
Caulopteris anglica, R. Kidston, Trans. Roy. Soc. Edinburgh, vol. xxxiii (1888), pt. ii, p. 392, pl. xxvi, f. 3. [a fragment showing frond cicatrices]	Coal Measures, Radstock.

Described and Figured Fossils (other than Type Specimens) in the Bath Museum.

MAMMALIA.	
Ovibos moschatus, Blainville sp., W. B. Dawkins, Pal. Soc. (1872), Brit. Pleist. Mam. pt. v, p. 19, pl. v. f. 1. [fragment of the skull of a female with horn-cores]	Pleistocene (river gravel), Freshford, near Bath.
REPTILIA.	
Teleosaurus temporalis, Blainville sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 181 ...	U. Lias, Ilminster.
PISCES.	
Sargodon tomicus, Plieneger sp., C. Moore, Quart. Journ. Geol. Soc. vol. xvii, p. 498, pl. xv, f. 1. [1 tooth in matrix]	Rhætic, Beer Crowcombe.

	STRATA AND LOCALITIES.
CEPHALOPODA.	
***Ammonites Aalensis, var. Moorei,** Lycett var., C. Moore, Quart. Journ. Geol. Soc. vol xxvi, p. 261, pl. xv, f. 1. [1 specimen]	Secondary, W. Australia.
***Ammonites macrocephalus,** Schlotheim sp., C. Moore, Quart. Journ. Geol. Soc. vol. xxvi, p. 261, pl. xv, f. 5. [1 specimen]	Secondary, Wollumbilla, Queensland.
***Ammonites radians,** Reinecke sp., C. Moore, Quart. Journ. Geol. Soc. vol. xxvi. p. 261, pl. xv, f. 2. [1 specimen]	Secondary, W. Australia.
***Belemnites canaliculatus,** Miller sp., C. Moore, Quart. Journ. Geol. Soc. vol. xxvi, p. 261, pl. xvi, f. 7. [1 specimen shewing canal]	Secondary, Wollumbilla.
***Belemnites paxillosus,** Phillips sp., C. Moore, Quart. Journ. Geol. Soc. vol. xxvi, p. 259, pl. xvi, f. 6. [section shewing phragmocone, canal and dorsal striæ]	Secondary, Wollumbilla.
GASTEROPODA.	
Amberleya (Turbo) capitanea, Münster sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 196, pl. vi, ff. 1—5. [3 specimens, 2 old, 1 young]	U. Lias, Compton.
"**Cerithium**" "**varicosum,**" E. Deslongchamps sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 199, pl. iv, f. 15. Syn. of Cryptaulax (Cer.) scobina, Desl. sp., R. Tate, Ann. Mag. Nat. Hist. 4th ser. vol. iv. (1869), p. 419. Syn. of Cryptaulax (Turritella) undulata, Quenstedt sp., Hudleston and Wilson, MS. Catalogue (1892). [4 specimens]	U. Lias, Ilminster.
Cerithium "**verrucosum,**" Terquem sp., C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 563, pl. xvi, f. 23. [1 specimen in matrix]	L. Lias, Bridgend.
"**Chemnitzia**" (**Cerithium**) "**Henrici,**" Martin sp., C. Moore, Quart. Journ. Geol. Soc. vol. xvii, p. 509, pl. xvi, f. 12. Not so, but Syn. of Ch. alpina, A. von Dittmar, "Die Contorta Zone," p. 139	Rhætic, Beer Crowcombe.
Neritina arenacea, Terquem sp., C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 564, pl. xv, ff. 23, 24. [2 specimens]	L. Lias, Brocastle.
Neritina canabis, Terquem sp., C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 564, pl. xv, ff. 21, 22. [2 specimens]	L. Lias, Brocastle.
Neritina Hettangiensis, Terquem sp., C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 564, pl. xv, f. 26. [1 specimen]	L. Lias, Southerndown.
Neritopsis exigua, Terquem sp., C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 547, pl. xv, f. 19. [several specimens, 1 figured]...	L. Lias, Brocastle

GASTEROPODA—*continued.*

	STRATA AND LOCALITIES.
Patella Dunkeri, Terquem sp., C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 564, and Tate and Moore, "Brit. Lias Gast."† pl. i, ff. 10a, b	L. Lias, Brocastle.
***Patella Hettangiensis**, Terquem sp., Tate and Moore, "Brit. Lias. Gast."† pl. i, ff. 11a, b; R. Tate, Quart. Journ. Geol. Soc. vol. xxiii, p. 311. [1 specimen]	L. Lias, Sutton.
Pleurotomaria De Buchi, E. Deslongchamps sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xxiii, p. 550, pl. xvii, ff. 13, 14. [1 specimen]	Liassic vein of Holwell.
"**Pleurotomaria**" **heliciformis**, E. Deslongchamps sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 205, pl. v, f. 14. Cryptænia, Tate, Quart. Journ. Geol. Soc. vol. xxiii. p. 311. [1 specimen]	M. Lias, Ilminster.
"**Turbo**" **Bertheloti** ? D'Orbigny sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 210, pl. vi, ff. 7, 8; altered to Turbo Hornesi ? Stoliczka sp., C. Moore, vol. cit. p. 219. Syn. of Cirrus Leachii, Sow. var. Hudleston and Wilson, MS. Catalogue (1892)	U. Lias, Compton.

SCAPHOPODA.

†**Dentalium etalense**, Terquem and Piette sp., Tate and Moore, "Brit. Lias Gast."† pl. 1., f. 0. ...	L. Lias, Stout's Hill.

PELECYPODA.

Anatina ? "**præcursor,**" Quenstedt sp., C. Moore, Quart. Journ. Geol. Soc. vol. xvii, p. 507, pl. xvi, f. 3. Syn. of Anat. rhætica, Gümbel sp., A. von Dittmar, "Die Contorta zone," p. 186 [right valve in matrix]	Rhætic, Beer Crowcombe.
Anatina ? "**Suessi,**" Oppel sp., C. Moore, Quart. Journ. Geol. Soc. vol. xvii, p. 507, pl. xvi, f. 2. Non A Suessi, Oppel sp , A. von Dittmar, "Die Contorta Zone," p. 187	Rhætic, Beer Crowcombe.
Avicula contorta, Portlock sp., C. Moore, Quart. Journ. Geol. Soc. vol. xvii, p. 499, pl. xv, f. 10. [left valve in matrix]	Rhætic, Vallis near Frome.
"**Axinus**" "**cloacinus,**" Quenstedt sp., C. Moore, Quart. Journ. Geol. Soc. vol. xvii, p. 502, pl. xv, f. 16. Syn. of Isodonta (Tæniodon) Ewaldi, Bornemann sp., R. Tate, Yorkshire Lias, p. 394. Schizodus Ewaldi, Bornemann sp., A. von Dittmar, "Die Contorta Zone," p. 174. [left valve in matrix]	Rhætic, Beer Crowcombe.
Cardium Rhæticum, Merian sp., C. Moore, Quart. Journ. Geol. Soc. vol. xvii, p. 504, pl. xv, f. 28, C. Philippianum, Quenstedt; C. Rhæticum, Winkler and Dittmar. [left valve in matrix] ...	Rhætic, Beer Crowcombe.

PELECYPODA—*continued.*	STRATA AND LOCALITIES.
Gervillia præcursor, Quenstedt sp., C. Moore, Quart. Journ. Geol. Soc. vol. xvii, p. 500, pl. xv, ff. 6, 7. [right valve in matrix, left valve showing traces of original colour in radial bands from umbo]	Rhætic, Beer Crowcombe.
Lima præcursor, Quenstedt sp., C. Moore, Quart. Journ. Geol. Soc. vol. xvii, p. 500, pl. xv, f. 9. [right valve in matrix]	Rhætic, Beer Crowcombe.
"**Modiola**" "**minima,**" Sowerby sp., C. Moore, Quart. Journ. Geol. Soc. vol. xvii, p. 505, pl. xv, ff. 26, 27. Syn. of Mytilus minutus, Münster sp., A. von. Dittmar, "Die Contorta Zone," p. 167. [2 specimens in matrix, 1 adult, 1 young]	Rhætic, Beer Crowcombe.
Myophoria (Trigonia) "postera," Bronn sp., C. Moore, Quart. Journ. Geol. Soc. vol. xvii, p. 507, pl. xvi, ff. 8—10. Syn. of M. Emmrichi, Winkler sp., A. von Dittmar, "Die Contorta Zone," p. 172. [Right and left valve in matrix]	Rhætic, Beer Crowcombe.
Ostrea intusstriata, Emmrich sp., C. Moore, Quart. Journ. Geol. Soc. vol. xvii, p. 501, pl. xvi, f. 25. [1 specimen]	Rhætic, Beer Crowcombe.
"**Placunopsis**" **(Anomia) alpina,** Winkler sp., C. Moore, Quart. Journ. Geol. Soc. vol. xvii., p. 500, pl. xvi, ff. 4, 5. Ostrea, A. von Dittmar, "Die Contorta Zone," p. 156	Rhætic, Beer Crowcombe.
Posidonomya Bronnii, Münster sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 218, pl. vii, f. 16. [complete shell]	U. Lias, Ilminster.
BRACHIOPODA.	
Kingena lima, Defrance sp., T. Davidson, Pal. Soc. Brit. Foss. Brach. vol, i, pl. ii, p. 42, pl. iv, f. 23. [complete shell]	Cret. (Chloritic Chalk), Chard.
Leptæna Davidsonii, Deslongchamps sp., C. Moore, The Geologist, vol. iii (1860), p. 445, pl. xiii, ff. 21, 22. [dorsal valve]	U. Lias, Ilminster.
Rhynchonella furcillata, Theodori sp., T. Davidson, Pal. Soc. Brit. Foss. Brach. vol. i, pt. iii, p. 69, pl. xiv, ff. 2—5. [3 specimens]	M. Lias, Ilminster.
Rhynchonella (Terebratula) serrata, J. Sowerby sp., T. Davidson, Pal. Soc. Brit. Foss. Brach. vol. i, pt. iii, p. 85, pl. xv, f. 1. [complete shell]	M. Lias, Moolham.
Rynchonella tetraedra, J. Sowerby, sp., T. Davidson, Pal. Soc. Brit. Foss. Brach. vol. i, pt. iii, p. 93, pl. xviii, ff. 6, 7. [2 complete shells]	M. Lias, Ilminster.
***Rhynchonella variabilis,** Schlotheim sp., C. Moore, Quart. Journ. Geol. Soc. vol. xxvi, p. 231, pl. x, ff. 11, 12. [dorsal and ventral valve]	Secondary, W. Australia.

BRACHIOPODA—*continued*.

	STRATA AND LOCALITIES.
"**Spirifera**" **Walcotti,** J. Sowerby sp., T. Davidson, Pal. Soc. Brit. Foss. Brach. vol. i, pt. iii, p. 25, pl. iii, ff. 2, 3. Spiriferina, T. Davidson, op. cit., vol. iv, p. 98. [2 complete shells] ...	L. Lias, Camerton and Radstock.
Terebratula perovalis, J. Sowerby sp., T. Davidson, Pal. Soc. Brit. Foss. Brach. vol. i, pt. iii, p. 51, pl. x, f. 4. [complete shell]	Inf. Oolite, Dinnington.
"**Terebratula**" **quadrifida**. Lamarck sp., T. Davidson, Pal. Soc. Brit. Foss. Brach. vol. i, pt. iii, p. 28, pl. iii, f. 8. Waldheimia. T. Davidson, op. cit. vol. iv, p. 157. [complete shell] ...	M. Lias, Ilminster.
Terebratula squamosa, Mantell sp., T. Davidson, Pal. Soc. Brit. Foss. Brach. vol. i, pt. ii, p. 50, pl. v, f. 11. [complete shell]	Cret. (Chloritic Marl) Chard
Thecidium triangulare, D'Orbigny sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. v (1855), p. 121, pl. iii, ff. 11, 12. Thecidea triangularis, D'Orb. sp., T. Davidson, Pal. Soc. Brit. Foss. Brach. vol. i, pt. iii, p. 14, and vol. iv, p. 106, pl. xii, ff. 25, 26. [complete shell and dorsal valve showing interior]	Inf. Oolite, Dundry.

CRUSTACEA.

Eryma elegans, Oppel sp., H. Woodward in Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 189. [cephalothorax showing lateral aspect and pair of chelæ]	U. Lias, Ilminster.
Eryma Grippini, ? Oppel sp , H. Woodward in Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 188. [4 chelæ]	U. Lias, Moolham.
Eryon (Coleia) antiquus ? Broderip sp., H. Woodward, Quart. Journ. Geol. Soc. vol. xxii, p. 496. [cephalothorax with chelæ and abdomen]	U. Lias, Ilminster.
Estheria minuta Alberti sp., T. R. Jones, Pal. Soc. (1862), Mon. Foss. Estheriæ, p. 58, pl. ii, f. 4. [right valve]	Keuper., Somerton.
Glyphea Heeri ? Oppel sp., H. Woodward, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 190. [2 specimens] ...	U. Lias, Ilminster.
Hefriga Frischmanni, ? Oppel sp., H. Woodward, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 189. [3 specimens, 1 nearly complete]	U. Lias, Ilminster.
Palinurina longipes, ? Münster sp., H. Woodward, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 188. [4 impressions in shale]	U. Lias, Ilminster.
Palinurina pygmæa, Münster sp., H. Woodward, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 187. [2 imperfect specimens, 1 showing cephalothorax, 1 abdomen]	U. Lias, Ilminster.
Penæus latipes, Oppel sp., H. Woodward, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 188. [2 imperfect specimens]	U. Lias, Ilminster.

	STRATA AND LOCALITIES.
ANNELIDA.	
Ditrypa etalensis, Piette sp., Serpula strangulata, Terquem, C. Moore, Quart. Journ. Geol. Soc. vol. xxiii, p. 539, pl. xvi, f. 32. [1 specimen]	M. Lias, Camerton.
ACTINOZOA.	
Isastræa Sinemuriensis, Fromentel sp., P. M. Duncan, Pal. Soc. Brit. Foss. Corals, 2nd ser. pt. iv, p. 30, pl. vii, ff. 1—4. [corallum on rock]	L. Lias, Brocastle.
Montlivaltia polymorpha, Terquem and Piette sp., P. M. Duncan, Pal. Soc. Brit. Foss. Corals, 2nd ser. pt. iv, p. 8, pl. vii, ff. 14, 15, pl. viii, ff. 1—4, 13—15. [a fractured corallum, a long and large specimen, and 2 corallites springing from a common base]	L. Lias, Brocastle.
Septastræa excavata, Fromentel sp., P. M. Duncan, Pal. Soc. Brit. Foss. Corals, 2nd ser, pt. iv, p. 32, pl. i, ff. 6, 7. [a corallum]	L. Lias, Brocastle.
Thecosmilia Martini, Fromentel sp., P. M. Duncan, Pal. Soc. Brit. Foss. Corals, 2nd ser. pt. iv, p. 14, pl x, ff. 6—9. [corallites in rock]	L. Lias, Brocastle, Ewenny, Cowbridge.
Thecosmilia Michelini, Terquem and Piette sp., P. M. Duncan, Pal. Soc. Brit. Foss. Corals, 2nd ser. pt. iv, p. 14, pl. viii, ff. 10—13, pl. x, ff. 10—14. [several coralla in rock]	L. Lias, Brocastle, Cowbridge, Laleston, Sutton Stone, Ewenny.
Thecosmilia rugosa, Laube sp., P. M. Duncan, Pal. Soc. Brit. Foss. Corals, 2nd ser. pt. iv, p. 13, pl. ii, ff. 1—6. [corallites in rock]	L. Lias, Brocastle.
Thecosmilia sp., P. M. Duncan, Pal. Soc. Brit. Foss. Corals, 2nd ser. pt. iv, pl. ii, f. 14. [peduncle of corallite]	L. Lias, Sutton.
FORAMINIFERA.	
Cristellaria (Nautilus) "acutauricularis," Fichtel and Moll. sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 228, pl. iii, f. 38	M. & U. Lias, Ilminster.
Cristellaria costata, D'Orbigny sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 228, pl. iii, f. 43	U. Lias, Ilminster.
Cristellaria (Nautilus) crepidula, Fichtel and Moll sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 228, pl. iii, f. 39	U. Lias, Ilminster.
Cristellaria (Robulus) cultrata, Montfort sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 227, pl. iii, f. 37	M. & U. Lias, Ilminster.
Cristellaria rhomboidea, Czjzek sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 228, pl. iii, ff. 40—42.	M. Lias, Ilminster.

FORAMINIFERA—*continued.*	STRATA AND LOCALITIES.
Cristellaria (Lenticulites) rotulata, Lamarck sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 227, pl. iii, f. 36	M. & U. Lias, Ilminster.
Dentalina (Nodosaria) communis, D'Orbigny sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 223, pl. i, ff. 12, 13	M. & U. Lias, Ilminster.
Dentalina (Nodosaria) filiformis, D'Orbigny sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 224, pl. i, f. 16	U. Lias, Ilminster
Dentalina (Nautilus) obliqua, Linné sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 224, pl. i, f. 17	M. & U. Lias, Ilminster.
Dentalina pauperata, D'Orbigny sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 224, pl. i, f. 14	M. & U. Lias, Ilminster.
Dentalina plebeia, Reuss sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 224, pl. i, f. 15	M. & U. Lias, Ilminster.
Flabellina rugosa, D'Orbigny sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 229, pl. iii, ff. 46—77	U. Lias, Ilminster.
Frondicularia complanata, Defrance sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 229, pl. iii, f. 47	U. Lias, Ilminster.
Frondicularia "striatula," Reuss sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 229, pl. iii, f. 48	M. & U. Lias, Ilminster.
Lingulina carinata, D'Orbigny sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 223, pl. i, f. 10	M. & U. Lias, Ilminster.
Lingulina tenera, Bornemann sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 223, pl. i, f. 11	M. Lias, Ilminster.
Lituola (Placopsilina) cenomana, D'Orbigny sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 221, pl. i, f. 1	U. Lias, Ilminster.
Marginulina ensis, Reuss sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 225, pl. ii, f. 23	M. & U. Lias, Ilminster.
Marginulina glabra, D'Orbigny sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 225, pl. ii, f. 22	M. Lias, Ilminster.
Marginulina (Nautilus) raphanus, Linné sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 225, pl. ii, f. 21	M. Lias, Ilminster.
Nodosaria hispida, D'Orbigny sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 223, pl. i, f. 9	M. & U. Lias, Ilminster.
Nodosaria humilis, Römer sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 222, pl. i, f. 5	M. & U. Lias, Ilminster.
Nodosaria paucicostata, Römer sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 223, pl. i, f. 8	M. & U. Lias, Ilminster.
Nodosaria (Nautilus) radicula, Linné sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 222, pl. i, f. 4	M. & U. Lias, Ilminster.
Nodosaria (Nautilus) raphanistrum, Linné sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 222, pl. i, f. 7	U. Lias, Ilminster.
Nodosaria (Nautilus) raphanus, Linné sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 222, pl. i, f. 6	M. & U. Lias, Ilminster.
"**Planularia**" "Bronni," Römer sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 226, pl. ii, f. 30	M. & U. Lias, Ilminster.
Planularia (Marginella) harpula, D'Orbigny sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 227, pl. iii, ff. 34, 35	U. Lias, Ilminster.
Planularia longa, Cornuel sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 226, pl. ii, f. 27	M. & U. Lias, Ilminster.

	FORAMINIFERA—*continued.*	STRATA AND LOCALITIES.
	Planularia pauperata, Parker and Jones sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 226, pl. ii, ff. 24, 25, ? 26	M. & U. Lias, Ilminster.
T	**Planularia reticulata**, Cornuel sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 227, pl. ii, ff. 31—33	M. Lias, Ilminster.
	Polymorphina compressa, D'Orbigny sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 230, pl. iii, f 50	M. Lias, Ilminster.
	Polymorphina (Serpula) "lactea," Walker and Jacob sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 230, pl. iii, f. 49	M. Lias, Ilminster.
	Vaginulina lævigata, Römer sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 225, pl. i, f. 19 ...	M. & U. Lias, Ilminster.
	Vaginulina (Nautilus) legumen, Linné sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 224, pl. i, f. 18	M. and U. Lias, Ilminster.
	Vaginulina striata, D'Orbigny sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 225, pl. i, f. 20 ..	U. Lias, Ilminster.
	Webbina (Trochammina) irregularis, D'Orbigny sp., C. Moore, Proc. Som. Nat. Hist. Soc. vol. xiii, p. 221, pl. i, ff. 2, 3	U. Lias, Ilminster.
	PLANTÆ.	
	Naiadita acuminata, ? J. Buckman sp., C. Moore, Quart Journ. Geol. Soc. vol. xvii, p. 512. (not figured)	Rhætic Vallis, near Frome.

List of the principal works relating to the Fossil "Types" and Described Specimens in the Bath Museum.

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1826—1840. A. Goldfuss, Petrefacta Germaniæ.
1847. T. Davidson and J. Morris, Descriptions of some species of Brachiopoda. *Ann. Mag. Nat. Hist. n.s. vol. xx.*
1850—1855. A. D. D'Orbigny, Paléontologie Française, Terrains Jurassiques, vol. ii.
1852. P. M. G. Egerton, Figures and Descriptions illustrative of British Organic Remains. *Mem. Geol. Survey of the United Kingdom, dec.* vi.
1852—1854. T Davidson, A Monograph of the British Cretaceous and of the British Oolite and Liassic Brachiopoda. *Pal. Soc. Brit. Foss. Brachiopoda vol. i, pts. ii and iii, and Supplementary Appendix to same.*

LIST OF THE PRINCIPAL WORKS RELATING TO THE "FOSSIL TYPES," &c.—*continued.*

1855. C. Moore, On new Brachiopoda from the Inferior Oolite of Dundry, &c. *Proc. Somerset Nat. Hist. Soc. for 1854, vol. v (1855).*

1860—1861. C. Moore, On new Brachiopoda and on the development of the loop in *Terebratella. The Geologist, vol. iii (1860)* and *vol. iv (1861).*

1861. C. Moore, On the Zones of the Lower Lias and the *Avicula contorta* Zone. *Quart. Journ. Geol. Soc. vol. xvii.*

1862. T. Rupert Jones, A Monograph of the Fossil Estheriæ. *Palæontographical Society.*

1864. A. von Dittmar, Die Contorta Zone (zone der *Avicula contorta*, Portl.).

1866. H. Woodward, Notes on the species of the Genus *Eryon*, Desm. from the Lias and Oolite of England and Bavaria. *Quart. Journ. Geol. Soc. vol. xxii.*

1867. C. Moore, On the Middle and Upper Lias of the South West of England. *Proc. Somerset Nat. Hist. Soc. vol. (for 1865-66) xiii.*

1867. C. Moore, On abnormal conditions of Secondary Deposits when connected with the Somersetshire and South Wales Coal basin; and on the age of the Sutton and Southerndown series. *Quart. Journ. Geol. Soc., vol. xxiii.*

1867. P. M. Duncan, A Monograph of the British Fossil Corals. Second series, pt. iv. *Palæontographical Society.*

1870. C. Moore, Australian Mesozoic Geology and Palæontology. *Quart. Journ. Geol. Soc. vol. xxvi.*

1871. R. Owen, Mesozoic Fossil Mammals. *Palæontographical Society.*

1872. W. B. Dawkins, British Pleistocene Ovidæ. The British Pleistocene Mammalia pt. v. *Palæontographical Society.*

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1876. R. Tate and J. F. Blake, The Yorkshire Lias.

1877. H. Woodward, A Catalogue of British Fossil Crustacea. British Museum, 1877.

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2. New Brachiopoda from the Inferior Oolite of Dundry, &c.
   Proc. Som. Arch. & N.H. Soc., 1854.
3. On the presence of Bubalus Moschatus in the Drift of Wiltshire.
   Paper read at the Meeting of the Opening of Blackmore Museum, 1857.
4. On the so-called Wealden beds at Linksfield, and Reptiliferous Sandstones of Elgin.
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5B. Continued in vol. iv, p. 96 and 190, 1861.

6. On the Zones of the Lower Lias and the Avicula-contorta Zone
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7. On the Geology of the South-West of England.
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8. On the Middle and Upper Lias of the South-West of England.
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9. On Abnormal conditions of Secondary Deposits when connected with the Somersetshire and South Wales Coal Basins; and on the age of the Sutton and Southerndown Series.
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14. On the presence of Naked Echinodermata (Holothuria) in the Inferior Oolite and Lias.
Report of B.A., Brighton, p. 117, 1872.

15. On the Age of the Durdham Down Deposit, yielding Thecodontosaurus, &c.
Report of B.A., Bristol, p. 77, 1875.

16. On the presence of the Genera Plicatocrinus, Cotlehderma and Solanocrinus in British Strata.
Letter to Geol. Mag. n. ser. Decade ii, vol. ii, p. 626, 1875.

17. The Banwell Bone Caves.
An Address delivered before the Som. Arch. & N.H. Soc. at the Cheddar Field Meeting, 1877.

18. Notes on the Palæontology and some of the Physical Conditions of the Meux Well Deposits, Q J.G.S., vol. xxxiv, p. 914, Read Nov. 1878.

19. On Ammonites and Aptychi.
Report of B.A., Sheffield, p. 341, 1879.

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23. Notes on Wiltshire Geology and Palæontology.
Wilts Arch. & N.H. Mag., vol. xx, p. 45, Aug., 1881.

The Carthusian Priory of Hinton. *By* E. T. D. FOXCROFT, J.P., D.L., &c.

(Read April 28th, 1891.*)*

Having been asked by the Secretary to contribute a paper to the members visiting Hinton Abbey, I have ventured to offer a short account of the Carthusian Priory of Hinton, though with some natural trepidation, as I feel myself but poorly equipped for a task which demands resources which I feel I do not possess. Let me say at once that I do not profess to approach the subject *from a strict archæological standpoint.* I do not aim at doing more than attempting to give a mere outline of the history of this religious foundation, leaving the completer account to other and abler hands which I hope may in time take up a rather neglected page of our local archæology. My consolation must be that a more thorough handling of the subject might lead to a minuteness and prolixity which would extend the paper beyond the limits permissible on an occasion like the present.

In passing along the New Warminster Road, near what would be the sixth milestone, had the old Turnpike Trustees or the modern County Council seen fit to place those useful landmarks on this particular highway, the eye is arrested by an ancient building of a rather peculiar form; a lofty, four-gabled erection, ending in a lower construction to the East. At a distance of a few hundred yards to the N.W. stands a moderate-sized manor-house of Elizabethan character. The gabled building is the principal remaining fragment of the old Carthusian Priory of Hinton. The manor-house has undoubtedly been constructed from the materials of other monastic buildings which were demolished after the Dissolution. The fragment I have mentioned is not, however, all that is left of the old Priory. I shall describe the other remains later on, and shall attempt to assign to the buildings that are still standing what I believe were the uses to which they were put by the Brethren who inhabited them some 350 years ago. Let me attempt to give you shortly the history of this foundation. As far as I know, there is no *Cartulary* or Chronicle of the Priory extant. What is known is found in what remains of the "Book of Lacock" (a sister foundation), and in a Chronicle in the Library of Lincoln College, Oxford, quoted by Leland in his Collectanea ii. 341.

This Priory owes its foundation to a noble lady, Ela, only daughter of William de Eureux, Earl of Salisbury, a descendant of Edward de Sarisbui, on whom William the Conqueror bestowed the Manors of Hinton and Norton, in addition to large possessions in the County of Wilts.* At her father's death Ela was secretly conveyed to Normandy and romantically rescued by an English knight, William Talbot, who, in the guise of a troubadour, gained admittance to the castle where she was detained and finally carried her back to England and presented her to King Richard I., who gave her in marriage to William Longespé, the natural son of Henry II. and Fair Rosamond, whom he created Earl of Salisbury. Longespé, in addition to his military achievements, was inclined to works of piety and religion, and in the year 1220 laid the fourth stone of the present Cathedral of Salisbury, his wife, Ela, laying the fifth stone of the edifice. Longespé died a few years later (in the year 1227) it is said from the effects of poison at the table of the Justiciary Hubert de Burgh, and was the first person buried in the new Cathedral, where his tomb is still to be seen. His widow, Ela, determined to remain such, and was permitted to exercise in her own person the office of Sheriff of Wilts and Castellan of old Sarum. At the end of six years from the death of her husband she resolved on carrying out an intention she had long entertained, of founding a religious house. "When," says the Book of Lacock, "Ela had now survived her husband for seven years in widowhood, she was directed in visions that she shall build a monastery in honor of S. Mary and S. Bernard, in the meadow called Snails' Mead, near Lacock. Accordingly on the 16th April, 1232, she founded two monasteries in one day, in the morning that of Lacock, in which holy canonesses might dwell continually and most devoutly serving God, and in the afternoon the Priory of Hinton of the Carthusian Order." *Primo mane apud Lacock, et Henton port nonam.* This is the current story of the two foundations, but its accuracy may be doubted, though there is no physical impossibility with regard to the transaction, the distance being between the two places not more than 15 miles. Canon Bowles, in his "Annals of Lacock Abbey," questions the truth of this double foundation on the same day, on the authority of the Chronicle before referred to, which fixes the date of the foundation of Hinton on the 6th November, 1227, and other documents, but the story is a quaint one and ought to be mentioned in this connexion.

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* This William de Eureux was evidently high in favour with Richard I., for he carried the Rod at his first Coronation, and at the second Coronation, after Richard's return from captivity, he was one of four Earls who bore the Royal Canopy.

Ela's object in founding the Hinton Priory was no doubt in part attributable to respect for her husband's memory and wishes. Longespé had founded a Carthusian House at Hatherop, in Gloucestershire,* under the name of "Locus Dei," but the monks had apparently found the place unsuitable, and Ela accordingly translated the foundation, granting in exchange for Hatherop her Manor of Hinton with the advowson of the Church and also the Manor and advowson of Norton, to found a Carthusian House in the honour of God, the Blessed Mary, St. John the Baptist and All Saints, to be erected in the Park of Hinton.† Ela herself took the veil on Christmas Day, 1238, in the seventh year after the foundation of Lacock; and, on the Feast of the Assumption of the Blessed Virgin, A.D. 1240, she assumed the government of the Nunnery as Abbess, in which office she remained for 18 years, after which time she lived in retirement for five years, "and at length (says the Book of Lacock) yielding up her soul in peace, she rested in the Lord, and was most honourably buried in the Choir of the Monastery." The stone that covered her remains, removed from the altar of the Choir now destroyed, is placed in the Cloister of Lacock, and the inscription, in Monkish Latin, runs thus:

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* Near Fairford.

† The name "Locus Dei" was also transferred from Hatherop.

> "Infra sunt defossa Ela venerabilis ossa,
> Qua dedit hac sedes, sacras monialibus ædes.
> Abbatissa quidem quæ sancté vixit ibidem.
> Et Comitissa Sarum, virtutum plena bonarum."

She died in the 74th year of her age, and on the 24th August, A.D. 1261.

We now take leave of the pious Foundress, and return to her foundation of Carthusian Monks at Hinton. This Carthusian House was the second in date of foundation in England, the first settlement of the Order having been made at Witham, also in this County, in 1181, about 48 years before, by Henry II., who, as a penance for the murder of Becket, was commanded by the Pope to found a religious house, and in consequence sent over to La Chartreuse, near Grenoble, which had then been in existence about 100 years, and procured the sending over of Hugo (afterwards Bishop of Lincoln) and a few monks to start the first Carthusian establishment in his kingdom. It, was therefore, to use a cant phrase, the "last new thing in Monasteries." The dedication of Hinton was copied from that of Witham. The site chosen differed materially from that of the older Priory. Witham was founded in an "eremus," that is, a wild uncultivated tract, which was given to the Brethren to bring into cultivation, in accordance with the early custom of the Order. This tradition appears to have been departed from in the case of Hinton, where the land was comparatively fertile, and to have been equally disregarded in some of the later foundations. Strictness and austerity were, however, as they have always been, the characteristics of the Order of St. Bruno. Each member of the confraternity lived in a division of a three-roomed cottage, meeting his companions only in the chapel, or for the business of the house. They ate no meat. A loaf of bread was given to each brother every Sunday morning at the Refectory door, which was to last him during the week. An occasional mess of gruel was all that was allowed him in addition. His bedding was a horse-cloth, a pillow and a skin. His dress was horse-hair shirt covered *outside* with linen which was worn night and day, and the white cloak of the Order. A garden was attached to each building of three cells. Silence, solitude and prayer were enjoined by the rules of the Order, and the monks were forbidden to leave the grounds of the Priory. Such were the lives of the Brethren at all events in the earlier days of their establishment. Probably in later times they were somewhat relaxed. The regular number of Monks in a Charterhouse was 13, including the Prior. In addition, however, there were 13 lay brethren (conversi) who were engaged in farm labour. For these lay brethren there was a separate set of buildings called "domus inferior," with a guest house and a church. In the case of Hinton the habitat of the conversi was probably at a distance of about half a mile from the Priory, at a place called Frary or Friary.* King Henry III. granted to this Priory all the liberties and privileges previously granted to Witham, including immunity from taxation and forest laws, and a Bull of Priveleges was granted by Pope Innocent IV. (1245). Their lands were increased by succeeding benefactors, and extended to various neighbouring parishes in addition to Hinton and Norton, such as Wellow, Freshford, Lullington, Woodwick, Westwood and others. Richard II. gave them a hogshead of wine yearly from the Port of Bristol.

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* Friary is situated below the wood which bears its name and close to the banks of the river Frome, in a very secluded spot. All remains of conventual buildings have now disappeared, though I believe some existed at the beginning of the century. But the names "Friary," and "Old Church" remain and the site is well marked. Signs of the water wheel of the mill are to be traced in the basement of a ruined cottage on the river bank, and a depression in the garden above appear to mark the sight of the reservoir which supplied it.

Of the doings of these good men I can tell you but little.* The even tenour of their way appears to have been chiefly broken by jealousy of the secular clergy and restlessness under the yoke of Rectorial tithing power, to escape from which they invoked successfully the Episcopal Authority. First of all an agreement (date uncertain) seems to have been made between the Prior and Gilbert de Sarum, Rector of Hinton, by which the Prior and Convent were to hold the Church of Hinton in perpetual farm and to have their lands free of all tithe, in consideration of paying to the Rector and his successors 15 marks† a year. Then in 1344 we find that the Prior and Convent prevailed upon Bishop Ralph to "appropriate" the Church of Hinton to the Priory, by which transaction the Prior became Rector of Hinton. This document sets forth that it had been represented to him by the Priory that some of the lands were barren, that the profits from water mills (probably the one at Friary, before mentioned) had decreased, in fact that "agricultural depression had set in, and that, in consequence, their means were reduced and their ability to exercise proper hospitality had been curtailed, and that, wishing to relieve their burdens and necessities, the Bishop had determined to "appropriate" the Church to the Priory,‡ in other words he had made up his mind "to rob Peter to pay Paul." This and a subsequent transaction of a like nature paved the way to the complete impoverishment of the Living, and the spiritual interests of the community at large were sacrificed to the supposed necessities of a handful of monks. Nearly two centuries later, and not many years before the final Dissolution, there came an order from Wells, issued by Dr. John Pennande, Vicar General of the Diocese (the Bishop* being then in foreign parts), for the Union of the Churches of Hinton and Norton. It is, of course, the old story over again. The monks had again complained of various burdens and difficulties, the increasing demands of hospitality, repairs and additions to their buildings, expenses incurred in constructing "subterranean aqueducts, long and deeply dug and furnished with leaden pipes" (canale plumbeum). There was also a constant quarrel between the Priory and the Rector of Norton in respect of tithes of a certain Grange in the Parish of Norton, belonging to the Priory, which was an injury to the Priory and a scandal to religion. Further, the Church of Hinton was impoverished (a not unnatural result of previous transactions) and in view of these circumstances and of its contiguity to the Church of Norton, he, John Pennande, at the request of the Prior and Convent, deprives Hinton of the style of a parish church and unites it for ever to Norton. With a view to carrying out this arrangement John Cumberbatch, Vicar of Hinton, resigns, in consideration of £4 sterling pension from the Priory, and Laurence Philippe, Rector of Norton, also resigns with a pension of £8. The Parish Church of Norton is "appropriated" to the Priory as Rector,† the parson, now reduced to the position of "Vicar," receiving a reduced proportion of the tithes in Hinton and Norton, but excluding all tithes from the two Granges in Hinton and Norton, in compensation for which tithes he is to be paid by the Priory 4 marks* of good and lawful money in the Church of the said Priory and six wagon loads of firewood. If the Vicar serve, in his own person, one of the Churches, he is to provide a priest for the other; if he serve neither, then has he to find two priests, so that each church may have its own priest. This order is ratified by the Prior of Bath. In 1534, the nett value of the Vicarage of Norton cum Hinton is set down at £5 11s. 3d. To this extent had the monks succeeded in impoverishing the two Livings. The Church of Hinton was thus degraded from the position of a Parish Church to serve the needs of the monks, and its union with the Church of Norton continued for nearly 200 years, until 1824, when it was again separated and made a perpetual curacy, the endowment being a "modus," in lieu of tithes of some £12 a year, which has been supplemented by small grants from the Ecclesiastical Commissioners and Queen Anne's Bounty. This is a typical instance of what was no doubt a contributing cause of the Dissolution of Monastic Houses, an appropriation of Parochial Endowments, which estranged the goodwill of the Parochial Clergy and the Laity, and which resulted in the permanent impoverishment of many Livings.

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* No scandals, such as were in some cases no doubt justly imputed to the lesser Monasteries, have, as far as I know, ever been laid to their charge.

† £10.

‡ The Convent paying the Vicar "a suitable allowance" (congrua portio) *i.e.*, small tithes and altarages and £4 a year, with two wagon loads of wood, or 3s. and one wagon load of straw.

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* John Clark.

† As the Church of Hinton had been nearly 200 years before.

The next incident which I have to record in the history of the Priory, is another small appropriation of a different kind. At Longleat, near the site of the present mansion, was a Priory of Black Canons dedicated to S. Radegund. This Priory had become exceedingly impoverished, and it was accordingly dissolved in 1529, and what remained of its possessions was transferred to Hinton and continued to belong to it until its own dissolution, and it was called "the Cell of the Priory of Longleat."

A curious incident in connexion with a monk of Hinton, one Nicholas Hopkins, has to be recorded. This Hopkins had been Confessor to the ambitious Duke of Buckingham, whose fall is recorded in Shakespeare's Henry VIII. He had indulged in auguries or prophecies respecting the Duke's elevation to the throne. The Duke had sent from his castle at Thornbury to receive his auguries, and visited Hinton several times to consult him. He consulted the monk to his overthrow.* Shakespeare says :

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* £2 13s. 4d.

HENRY VIII.—*Act I., Scene I.*

Brandon. Here is a warrant from
The king, to attach Lord Montacute ; and the bodies
Of the duke's confessor, John de la Car,
One Gilbert Peck, his chancellor,—
Buckingham. So, so ;
These are the limbs of the plot : No more, I hope.
Brandon. A monk of the Chartreux.
Buckingham. O, Michael Hopkins ?
Brandon. He.

And *Act I., Scene II.*

Surveyor. He was brought to this
By a vain prophesy of Nicholas Henton.
King. What was that Henton ?
Surveyor. Sir, a Chartreux friar,
His confessor ; who fed him every minute
With words of sovereignty.

And *Act II., Scene I.*

1 *Gent.* There appeared against him, his surveyor ;
Sir Gilbert Peck, his chancellor ; and John Car,
Confessor to him ; with that devil monk,
Hopkins, that made this mischief.
2 *Gent.* That was he,
That fed him with his prophecies ?
1 *Gent.* The same.

The Duke was executed in 1521.

We now approach the period of Dissolution. After the final collapse of the "Pilgrimage of Grace," the last effort of resistance to the spoliation of the Monasteries, an impulse was given to the action of the King's Commissioners. The number of houses had been materially decreased and the signs of impending doom were unmistakeable. The execution of the three Carthusian Priors, Houghton of London, Webster of Axholme, and Laurence of Beauvale, had no doubt struck terror into the Carthusians. So called "surrenders" were the order of the day; and as to the spirit in which these surrenders were made, striking evidence is forthcoming in a letter written by Edmund Horde, last Prior of Hinton, to his brother Alan, of the Middle Temple (Cott Man). "In the Lord Jesus shall be your salvation. And when ye marvel that I and my brethren do not freely give and surrender up our house at the motion of the King's Majesty, truly, brother, I marvel greatly that ye think so. And considering that there is no cause given by us why the house shall be put down, but that the services of God, religious conversation of the brethren, hospitality, alms-deeds, with all our other duties, be as well observed in this poor house as in any religious house in this realm, which we have trusted that the King's grace will consider. But because that ye write of the King's high displeasure, I will endeavour myself, as much as I may, to persuade my brethren to conformity in this matter, so that the King's highness shall not have any cause to be displeased with us, trusting that my poor brethren, which know not where to have their living, shall be charitably looked upon. Thus our Lord Jesu preserve you in grace." E. Horde.

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* The old chronicler, Hall, speaks of "Hopkins, the monk of the Priorie of the Charterhouse, beside Bath, which like a false hypocrite had induced the Duke to treason, with his false forged prophecies." And says also : "A monk of the Charterhouse showed the Duke that he should be King of England. Alas ! that he ever gave credence to such a false traitor."

Such was the spirit of the surrender of the Prior and Brethren of Hinton. And soon the surrender came.

Cromwell had long had his eye on this House, and Walter Lord Hungerford, a near neighbour at Farleigh, had asked him for the "spoil" of it. Accordingly the King's Commissioners, Tregonwell and Petre, arrived at Hinton, after dissolving the Abbey of Keynsham, on the 25th January, 1539. Persuasion was tried, at first without success, only three monks being "conformable," one Monk Nicholas Balland expressly denying the King's supremacy and affirming that the Bishop of Rome was supreme head of the Church. But by the 31st March of that year, the opposition to the King's demands was broken down and on that day Prior Horde and fourteen monks signed the surrender. Two others, one of whom was the said Nicholas Balland, apparently did not sign the document. The nett value of the Priory, at the date of surrender, was £248.* Walter Lord Hungerford was appointed Chief Steward and Surveyor, and the buildings were sold to him by Tregonwell. Three months later we find a letter from Hungerford to Cromwell, complaining that Sir Thos. Arundell had "sold and despoiled and carried away a great part of the Church and other superfluous buildings," which shows that the work of demolition was immediately begun. Hungerford also states that Harry Champneys, of Orchardleigh, had broken into the Prior's Cell and taken away "King's Evidence," or title deeds, and he begs for the Manors of Norton and Hinton. These incidents indicate the "ugly rush" which had set in for Monastic plunder. At the close of the year the site of the Priory and the Grange, some quarter mile distant, were granted to Hungerford for 21 years. Hungerford did not, however, long enjoy his acquisition, for he was attainted and beheaded on Tower Hill in the following summer, on the same day, it is said, on which Cromwell was beheaded, and all his property, Hinton included, passed to the Crown. Several members of the Hungerford family had shared the same fate, the third Lord Hungerford having lost his head in the Wars of the Roses, and his son, Sir Thomas, eight years later. The Priory came into Hungerford possession again in 1578, after passing through several hands. We find the names of John Bartlet, William Crouch, Matthew Colthurst (who probably erected the present Manor House), and Edmund Colthurst, who is described in 1573 in Somerset Visitations as "of Hinton."* Edmund Colthurst appears to have sold the Priory to Sir Walter Hungerford, son of the Walter Lord Hungerford who was executed in 1578. In 1599 the Priory was leased to Mrs. Shaa, sister of Sir Edward Hungerford who died in 1613, and whose tomb is in the smaller chapel of Farleigh Castle. In 1615 the Manors of Hinton and Norton were granted to Prince Henry, son of James I., and in 1616 to Prince Charles, afterwards Charles I. Some twenty years later they passed to Lord Craven, and an interesting survey of the two manors by Richard Parsons, which throws much light on the disposition of the land in the two parishes, is in the hands of Mr. Henry Withers, of Norton.† In 1660 another Sir E. Hungerford obtained the manors, and about 1684 the Hungerford property, including Hinton, was sold to Mr. Henry Baynton, of Spey Park. Early in the 18th Century the Baynton estates were sold, the site of the Priory and the adjoining lands being purchased by Walter Robinson, ancestor of the present proprietor of Hinton Abbey, the Grange and a considerable portion of the land in the parish being acquired by Mr. John Harding, ancestor of Mrs. Day, by whose will it passed into my family. My own house occupies the site of the "Grange" of the Priory, the name being still preserved in the "Grange Farm," which immediately adjoins it. Such is a short account of the history of the Priory and its dissolution.

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* The Prior received £11 as a gratuity and an annuity of £44, and the Monks gratuities of £29 16s. 8d. and pensions amounting to £119 6s. 8d.

I will conclude by attempting a short description of the existing remains of the Conventual Buildings. The Church has disappeared, so have the monks' dwellings and the Prior's Lodge and Cloisters. The position of these can only be conjectured by reference to other Charterhouses. What remains probably represents the

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* These Colthursts would appear to have been land jobbers of the period. Bath Abbey came into their possession, so did the Manor of Claverton, which was sold by them to the Hungerfords.

† The Grange of Hinton was then leased to the Countess of Rutland, widow of Sir E. Hungerford.

Chapterhouse, the Refectory, and the buttery or Kitchen.* The Chapterhouse block is of three stories and constitutes the principal feature. The length of this building is about 33 feet by 18 feet in breadth. The lower story, which probably served as a Chapterhouse, is vaulted with stone and is lighted by a triple Lancet E. window, and two single Lancets N. and S., near the E. end. There are Sedelia on the S. side, injured, but good.† A spiral stone staircase leads to an upper chamber, also vaulted in stone and lighted by three single Lancets, one to the W. and two to the S. It is likely that this upper chamber was used as a Library; and with reference to the Library, a curious Indenture of the year 1343 is in existence, specifying certain books as having been lent by the Prior and Convent of Hinton to another religious House, and containing an engagement under seal that the books shall be safely restored. Such an Indenture would sometimes be valuable in private life. The books are mostly religious works, but there is one treatise on gardening. The third story is a Columbarium. Evidently the Monks of Hinton were great pigeon-keepers.‡ Adjoining this block are the remains of the springing of an Arch, indicating the position of the Church on the N. side, the foundations of which may be traced in a dry summer, suggesting a possible length of about 70 feet.

To the S. W. of the Chapterhouse block is a building which I believe represents the Refectory, stone groined, and measuring 30 feet by 22 feet, the piers sunk some feet in the ground, owing to the rising of the soil. Overhead is a loft running the whole length of the building, with the remains of several windows now stopped up, which I conceive may have been a Guests' Dormitory. Beyond the Refectory is a chamber some 22 feet by 12 feet, also stone groined, with a large fireplace at the W. end, and a serving hutch. This was probably the Kitchen or Buttery. Both rooms are of good Early English architecture, but badly mutilated. The presence of Corbels suggests a covered passage running from the Chapterhouse to the Refectory, and also a Cloister or Ambulatory on the S. side of the Refectory. The buildings probably did not extend further W. than the Buttery; but it is likely from the analogy of other Charterhouses, that there were two Courts, on the S. and on the N. of the Chapterhouse, containing the three-roomed Cottages of the Brethren. There is no trace of a Cemetery.* The succession of Ponds to the W. of the buildings may represent the Fish-ponds of the Priory. It is possible that the old wall on the side of the road leading to Freshford may have some connection with the enclosing wall of the Demesne.

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* I call the principal block the "Chapterhouse." It has been usually called the Chapel, but, as there is every reason to believe that the Church stood close by, it could hardly have been a Chapel.

† The two Westernmost Bays are plainer than the Eastern Bays and differently vaulted. The whole is a good specimen of Early English Architecture.

‡ On the N. of the block is a small erection apparently of more recent date, consisting of a vaulted corridor below and a small chamber above.

Such is a brief and very imperfect account of the Carthusian Priory of Hinton, neither in extent or wealth or in the interest of its annals among the important Monastic Houses of England, but the second in foundation among Charterhouses, and one of the two Somersetshire Houses of the Order which contained only nine Houses in all England. As we have seen, the hand of the destroyer was soon laid upon some of the principal buildings, as soon almost as the ink was dry in which the deed of surrender was written, and greedy men were quarrelling over the very stones.

Those stones built the Manor House, and no doubt built many other things. The dissolved Priory became a quarry, as so many other old Abbeys and Castles have become. In how many walls and cottages may they not be hiding themselves! The wonder in this case is why more was not removed. Excavation has not, up to the present time, been undertaken. Judicious work of that kind will probably unravel a good deal that is obscure and conjectural. The extent of the Chapel would be undoubtedly indicated. Much too may still be gathered of the history of the Priory which would be a valuable addition to the meagre account to be found in Collinson, and I have the satisfaction of knowing that the elucidation of this history is in far abler hands than my own, and that a more perfect record may some day be looked for, which will form an interesting chapter in what we all look forward to—*an improved County History of Somerset.*

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* But it is probably situated on the N.E. of the Chapterhouse.

Summary of Proceedings for the Year 1891—92.

Mr. President and Gentlemen,

The Anniversary meeting was held as usual on the 18th Feb., 1891, when the routine business was gone through, the various officers elected, and the Club's year, rather a memorable one in some respects, commenced. The winter session for the afternoon meetings concluded on March 18th, 1891, when two papers were down for reading—" Some Notes on Bath Books," by F. Shum, F.S.A.; and a communication from Mr. W. H. Tagart on his recent expedition to Siberia; the former paper, being especially a local one and the writer a man who had accumulated a mass of information on the subject and a well-known and enthusiastic collector of Bath literature, occupied so much of the time allotted that Mr. Tagart kindly offered to postpone the account of his travels to another occasion. A portion of Mr. Shum's paper is printed in full (*vide* p. 179).

The session for 1891-92 was inaugurated by the President, notwithstanding his advanced years, reading a paper on the " Distribution and Movements of British Animals and Plants," (*vide* p. 185.) The attendance was very good although one of the most severe gales of the season was just at that time at its height. Some of those who walked down to the Institution had literally to watch their opportunity to avoid being struck on the head by the chimney pots and tiles which were falling around them in a most dangerous way. Several were prevented from attending for this reason. Canon Ellacombe, who was in the chair, said the warmest thanks of the Club were due to Mr. Blomefield for his excellent paper. He wished to impress upon the members what a great privilege it was for them to hear one of the most eminent as well as the oldest naturalist in England speak to them, and speak to them in such a way as no other naturalist was able to do at all on these subjects. He asked them to show their appreciation by their contribution of any facts or by asking any questions akin to the subject of the paper. One thing was certain. They could not venture to come down upon the reader, as was sometimes possible on such occasions, or to dispute his facts. As a contribution to the discussion, however, he would venture to state a few facts. They had all listened to that charming introduction to the paper respecting the range of the nightingale. That bird was once seldom heard at Bitton; recently a large number frequented that place. In the Quantocks, whose combes and valleys seem so well suited to them, every summer one or two are heard, but not many. As to the migration of birds, the recent observations of the lighthouse keepers had done much to increase our knowledge, and many of the common species were now known to be migrants, *e.g.*, the brown wren, the siskin, and even the robin redbreast. As to the increasing scarcity of birds in England, he questioned whether on the whole the individual species were less in number. The starlings and the rooks were more numerous; certainly at Bitton there were more rookeries now than formerly. He considered that the gun tax and the Act prohibiting the strewing of poisoned wheat had done much in the direction of allowing the birds to increase. Passing on to the flowers, the flora seemed to be much richer in England than it was some centuries ago,—*e.q.*, the elm, the walnut, and the horse chestnut, how abundant they were. As to the *Hordeum murinum,* he could not help thinking that it must have been plentiful in his boyish days, having a vivid recollection of the schoolboy tricks that used to be played him of putting the ears up his sleeves. Plants were confined to certain places very often, and did not range far beyond the spot where they were introduced. The Atlantic plants were only found on the west coasts, for instance, and also in the south of Ireland certain plants were found that had their origin in Portugal. The *Rosa hibernica* is only found in one place in Ireland; every other plant there was either European or American. As a curious instance of the appearance and disappearance of foreign plants, shortly after the Swinford Flax Mill, near Bitton, was built, the road was blue with the beautiful little flax flower, which disappeared together with the trade in that commodity. And he well remembered visits which he used to pay to a rough uncultivated field in the neighbourhood with his friends Buckle and Broome, often finding at least fourteen different species of orchids; but the plough being turned in all these had in a short time vanished, and he was glad to say the corn crop, too, shortly after failed likewise. The *London rocket,* too, was a curious example of the movement of plants. It was well known that it first came in after the fire of London, never having been seen before. Owing to the extension of the railways it suddenly appeared near Newcastle-on-Tyne, having been introduced there in a ballast heap. As to the great destruction of plants on Shapwick Moor, he found a very rare plant there in 1870, the *Andromeda;* indeed, several plants were thought to have been extirpated, but really had not been. The *Epipactis rubra* still exists at Painswick, and was found by Sir Joseph Hooker during a visit there this year. Mr. Blomefield had spoken of that curious and rare plant, the *Herminium monorchis,* and its tuber-bearing peculiarity. He would mention the *Crinum Capense* as similar in its method of producing tubers. Strawberries and nettles had also a peculiar habit of travelling. These instances were merely brought forward to show with what attention and interest he had listened to this admirable address.

The PRESIDENT, in reply, said that migration was now much better understood through the observations made at the great lighthouses, especially that on Heligoland. He did not think it very likely that the numbers of the birds had greatly increased. It must be remembered that birds often shifted their ground and made small migrations.

Mr. SKRINE spoke as to the very learned and valuable paper they had just heard, and how fortunate they were in still having amongst them a President who took so much interest in science. He thought birds had a great deal to do with the migration of plants, and instanced the fact that the white heath had recently appeared on Warleigh Hill amongst the leaf mould there. As to the rooks, he had observed that since the destruction of the trees and rookery on the site of the present St. Andrew's Church many more had come to Warleigh.

Dr. MANTELL spoke of the great increase of sparrows in 1871, much to the disgust of the Devonshire farmers—and this rather memorable afternoon's meeting was closed.

The second afternoon meeting was held on Wednesday, December 16th, 1891, at the Literary and Scientific Institution, when a paper was read by the Rev. Canon Ellacombe on "Old Field Names." There was a good attendance of members to hear a most interesting paper which was written at a suggestion made many years since by Dr. Prior. It was confined entirely to his own parish of Bitton, and first dealt with such generic names as field, meadow, close, leaze, tyning, paddock, barton, hayes, &c., and traced in a very interesting fashion their origin (*vide* p. 200).

At the conclusion of the paper the Secretary remarked that the club was deeply indebted to Canon Ellacombe for his valuable contribution to its Proceedings, which must have caused some considerable trouble to compile. He put a few queries to the reader of the paper, and asked the meaning of Cold Harbour. He was followed by the Rev. W. T. Blathwayt, who said that at Dryham there was a field called Bellasus, and he should like to know if Canon Ellacombe could explain the meaning. The Rev. P. E. George mentioned that at Combe Hay a field, which rose from the valley on the Wellow side, was called Yostes. Dr. Mantell, as instancing the way in which names were corrupted, mentioned that in Gloucestershire there was a field originally called the Loans, but it had now become the Lawns. Col. Wright spoke of a place in Somersetshire known as Tyning Trap, which he understood meant the steep ascent leading to the Tyning. The Rev. W. H. West remarked on the pretty field names used in Wales, and also mentioned that at Sherborne there was a place called Cold Harbour. Canon Ellacombe, in reply, said the name of Cold Harbour appeared in all parts of England, and its meaning had been the subject of much discussion. Mr. Nichols, however, came to the conclusion that the name carried its own meaning, and arose from the camps or halting places of the Roman soldiers in this country. He considered that Tyning always meant an enclosure. He had little doubt that Yostes implied the steep ground rising from the water. A vote of thanks, carried by acclamation, brought the proceedings to a close.

The third afternoon meeting was held at the Royal Literary and Scientific Institution on Wednesday, January 13th, 1892, Canon Ellacombe in the chair. Mr. E. Green read a paper recording the visits to Bath of two Queens; viz., Anne, wife of King James II, and Anne, Queen Regnant (*vide* p. 213). On the conclusion of the paper the Chairman said the Club was much indebted to Mr. Green for his always interesting papers, which gave so much information as to the domestic life of past ages, and helped to make up the history of our country. The question of Queen Anne visiting Dyrham was one of much doubt, but there was a tradition that a grand bed at Dyrham was the one which the

Queen occupied during her stay there. He questioned why if the Queen came into Bath from the direction of Toghill she came to Lansdown instead of through Swainswick, but Mr. Green explained that the latter was a modern road. With reference to the numerous pieces of plate presented from time to time to various sovereigns, Mr. Ellacombe said that as a rule they were always kept, and there was, he believed, enormous quantities preserved at Windsor and Buckingham palaces. It would, he said, be interesting if those articles which had been presented by the citizens of Bath could be discovered and exhibited. He remarked on the difference in olden time of the ushers preceding the royal visitors and spending money at private houses in preparing for their reception, whereas in the present the expense of the visit was borne by the hosts themselves. He asked for explanation as to the purveyors. Lieut.-Gen. Burn inquired as to the situation of the Abbey house, and Mr. Henderson for some further particulars respecting the Hyde Park in Bath. The Secretary asked for information as to the point where the Queen crossed the Wansdyke. He said that the charges made by the ushers appeared small even when compared with the different relative value of money in the present day. Mr. Green, in replying, explained that the purveyors who were a great hardship to the country from the time of Elizabeth down to Charles II, simply helped themselves from the people of any supplies which were needed without payment. Abbey house, he said, was situated where Kingston buildings now stands, and Hyde Park was probably a portion of the High Common or land which at one time formed part of it, as it appeared to have been passed by the road winding down from Lansdown, and leading to the West gate. He could not explain the origin or meaning of the name, neither had he any particulars as to the point where the road crossed the Wansdyke near Devizes, except that it was in the neighbourhood of Bishops Cannings.

On the fourth meeting held on February 17th, 1892, in the

Conversation Room of the Institution, the Secretary read his "Notes on Charles Moore's life and work; with a list of his fossil types in the Bath Museum." The chair was taken by the Rev. Prebendary Shaw and there was a good attendance. Mr. Winwood, having sketched the early career of Mr. Moore, bore testimony, from his long association with him in his favourite pursuit, to the patient industry and indomitable perseverance with which his lamented friend pursued his labours (*vide* p. 232). At the conclusion of the paper the Chairman said they had to thank Mr. Winwood for his admirable biographical sketch of a former member of the Club. He trusted that the result of Mr. Moore's labours which they had in the Museum might never be relegated to the cellars in the way that some other articles had been by those who could not appreciate them. Mr. McMurtrie said he had listened with very great pleasure to the memoir just read by Mr. Winwood, and he begged to move that the paper be printed in extenso in the Proceedings of the Club. The writer, in his anxiety not to occupy too much of their time, had passed over a good deal of what he had written; but he (Mr. McMurtrie) hoped it would be printed in full, so that they might place on record the work of one of the most eminent geologists that the West of England had ever produced; and he was sure they would all read the paper when it appeared in their Proceedings with even greater pleasure than they had listened to it that day. It was rather a wonder that no memoir on the subject had ever been written before, and he was glad it had fallen into such good hands as those of Mr. Winwood, on whom the mantle of Elijah seemed to have fallen; for it was not too much to say that but for his efforts, directly and indirectly, since Mr. Moore's death, geology would almost have ceased to exist in the Field Club. Mr. McMurtrie said he had not known Mr. Moore quite so long or so intimately as Mr. Winwood, but his acquaintance with him dated from about the year 1864, when they were preparing for the meeting of the British Association at Bath in the autumn of that year, and the acquaintance then commenced had continued without interruption down to the time of Mr. Moore's death. He looked back with pardonable pride on the friendship of such a man, and he could not but express his profound admiration of the work he had accomplished, in the face of much bodily infirmity, during the many years he had been connected with that Club. The paper of all others which had naturally most interested him was that on The Abnormal Secondary Deposits, and he could bear unqualified testimony to the painstaking way in which Mr. Moore had carried out this and all his work. In geologising over the same ground in after years, he (Mr. McMurtrie) had often come across features which struck him as new, but when he referred to Moore's papers he generally found that they had all been placed on record. The instance mentioned by Mr. Winwood, in which the early discoveries of Mr. Moore respecting the Rhætic formation and other matters had been steadily opposed by the geological survey until they had borne down all opposition, was much to their discredit; but they could now look back on this with satisfaction, for the truth had ultimately prevailed. Another point with which he had always been impressed was the infinite patience, perseverance and skill with which Moore had worked out his specimens, laying bare their most minute features in a wonderful way. Mr. McMurtrie hoped that the paper would not only be printed, but that, as they were well off for funds, one or two characteristic specimens illustrative of Moore's greatest discoveries would accompany the memoir. Col. Chandler seconded the proposition, and it was carried with acclamation. Mr. Winwood, in reply, said he hoped the members of the Club, or anyone acquainted with Mr. Moore, would communicate any further information regarding his life and work, so that the paper might be made as complete and correct as possible.

The attendances have been up to the average, but only on one occasion sufficiently large to render the Lecture Hall necessary, so that the Conversation Room has been found to afford sufficient, though rather cramped, accommodation. It has been found advisable to change the hour of meeting from 2.30 p.m. to 3 p.m. the original time.

EXCURSIONS.

Berkeley Castle.—The first excursion took place on April 14th to Berkeley Castle, under the guidance of Mr. W. Daubeny in the absence of the Secretary. Eighteen members joined the Midland train for Berkeley, waited the usual time in the porter's lodge; visited the Castle and Church, did full justice to the fare provided by "mine host" of the Berkeley Arms Hotel, the main portion of the party enjoying a pleasant walk back to Berkeley Road Junction and returned to Bath 5.22. The weather was beautiful and the excursion to the old Borough of Berkeley pleasant. Mr. Daubeny has been prevented from giving his promised "Notes on Berkeley," which were too voluminous to read during the excursion.

Stanton Drew.—The Geological excursion to the Lias cuttings in the Polden Hills on the Bridgwater Railway was given up owing to the inability of Mr. Mostyn Clarke the author of the paper printed in the last number of our Proceedings to be present; and one to Stanton Drew, conducted by Mr. W. Daubeny substituted.

A party of nine members started on Tuesday, May 26th, 1891, at 11.30, in a well appointed drag, supplied by Mr. Ames, for Stanton Drew, which they reached about 1 p.m. *viâ* Keynsham. More members would have joined the party but for illness and the uncertain appearance of the weather. The Vicar of Stanton Drew, the Rev. H. T. Perfect, most kindly met the party at the church, and pointed out its interesting features, both externally and internally, and exhibited several drawings of it, taken at different periods. The church has undergone repeated alterations, the greater part of it having been rebuilt in 1847, when the top of the tower was taken down and re-erected. The date, 1629, appears in the tower, and it is conjectured that the south aisle, new chancel and greater part of the tower were built about that time. The font is an interesting one, and evidently either early Norman or Saxon, thus showing the antiquity of the church. The staircase leading to the rood loft is plainly visible, as well as the exit from it. This superstructure was evidently placed across the old chancel arch. This chancel, however, is not only disused, but completely dismantled, and entirely blocked up by a lofty and unsightly huge pew claimed as the property of the lord of the manor. In 1847 the central arcade was moved a few feet northward, so as to give a more imposing effect to the S. aisle and new chancel. After inspecting the church, Mr. Perfect conducted the party round the several stone circles and remains, pointing out the different features of each, and explaining the views held by archæologists and others respecting their use, and the supposed object of the tribes in erecting these most curious structures. The party then proceeded to inspect the interesting old bridge over the Chew, where the brake met them, and after repeated thanks to the Rev. H. T. Perfect for his valuable services, they proceeded on their homeward journey, reaching Bath about five p.m.; having spent a pleasant day with occasional glimpses of sunshine, scarcely any rain and with food for reflection, both ecclesiastical and archæological. The secretary was prevented by illness from being present and giving some notes upon the lithological nature of the stones and the care taken of them by Mr. Coates, the lord of the manor.

Ludlow, June 16*th*, 1891.—This was a two day's excursion of which the following notes have been supplied by Mr. W. Daubeny. A party of eleven left the G.W.R. Station at 8.27 a.m., and after a considerable detention in consequence of the breakdown of a luggage train, they reached Ludlow at about 1.30—nearly one hour after the appointed time of arrival. They proceeded to the old and picturesque hostelry known as the "Feathers;" and after refreshing the inner man with a substantial cold luncheon, and bespeaking a brake for a drive about 3.30, the party proceeded to the Parish Church, where they were met by the Rector, the Rev. E. F. Clayton, who kindly lionised them over this Church. This remarkably fine old Church consists of a nave, N. and S. aisles, noble chancel, transepts, with chapels on the N. and S. sides of the chancel, and a central tower. The chapels and tower, as well as the roof of the nave, were undergoing repair and could not therefore be seen to advantage, but when all is completed it will certainly rank amongst our largest and most interesting parish churches. The entrance to the Church from the S. door leads into a lofty, handsome porch with stone groined roof. The font, both bowl and pedestal, is round and massive with no device upon it, but the bowl appears to have been much knocked about and chipped, and may probably originally have had some emblematical figures or design; it is evidently very old and certainly early Norman, if not Saxon. Handsome, carved oak screens divide the nave from the chancel, as well as the aisles from the two chapels. The chancel has no less than sixteen oak stalls on each side, with carved *miserere* seats; under each of the latter are various grotesque figures and devices. The windows are for the most part early English and Decorated, and some of the glass exceptionally good. There were several imposing monuments in the Church, amongst others one to Lady Eyre the wife of Sir John Eyre, "Lord of the Marches," and to Ambrosia, the daughter of Sir Henry Sidney, and to Sir John Bridgeman, both of these gentlemen being Lords of the Marches—the latter official was supposed to be very severe in his sentences, and a bellman in the town having been imprisoned by him for some offence composed the following epitaph on Sir John's death:—

"Here lies Sir John Bridgeman clad in his clay,"
"God said to the Devil, Sirrah, take him away."

After leaving the Church the members went back to the hotel and soon afterwards started for a most enjoyable drive; proceeding first to Downton Castle, they alighted and sent the brake round to meet them at the further end of the Downton grounds; then walked through a most lovely valley a distance of about two miles, the River Teme at their feet, and richly wooded lofty banks on each side of it. They then rejoined the carriage and drove back to Ludlow, via Barrington and Aston. At the latter place they stopped to inspect the exterior of a small but interesting old Norman Church; the tympanum over the doorway having a sacred emblem, and some grotesque figures on it well carved and in excellent preservation. After a good dinner at the Feathers some of the party accepted the kind invitation of the Rector of Ludlow to take a cup of coffee with him and stroll about his garden—a very enjoyable lounge after the fatigues of the day; and nothing could exceed the courtesy and attention both of the Rector and Mrs. Clayton, who pointed out the various objects of interest in their neighbourhood, with suggestions for divers excursions, &c.

The following day was devoted to exploring the Castle and Museum. The Castle is a remarkably fine structure, seated upon a bold wooded rock at the N.W. angle of the town, at the foot of which runs the Teme. It is surrounded by walls of great height and thickness and fortified with towers at irregular distances. Generally supposed to have been erected by Roger de Montgomery, Earl of Shrewsbury, about the early part of the 12th Century, it was afterwards forfeited to the Crown and remained more or less in the nominal possession of Royalty down to about the middle of the 15th Century, when it was held by the Duke of York and became the general rendezvous of the Yorkists. Edward the IV. made it the Court of his son, the Prince of Wales. Henry VIII. also appropriated it for his son, Prince Arthur, and in 1616 the creation of Prince Charles, afterwards Charles the I., to the principality of Wales and earldom of Chester, was celebrated at the Castle with great magnificence. In 1646 the Castle was surrendered to the Cromwellian party, and in 1688 the Court of the Marches was abolished, and the Lords Presidents were discontinued. Henry VIII. fixed this Court at Ludlow, which consisted of a Lord President, and as many Councillors as the Prince pleased, a Secretary, an Attorney, a Solicitor, and four Justices of the Counties of Wales. The Marches extended from Bristol to Chester, and the Lords Marchers had the power of life and death in their respective Courts, and in every frontier Manor a gallows was erected. The great tower and apartments on the W. and N.W. side, with the circular part of the Chapel, are considered to be the work of the founder, the remainder of the buildings were additions made probably in the 15th and 16th Centuries.

The small circular Chapel is a very interesting specimen of Norman work. Unfortunately it is unroofed, and the chancel is demolished, but the walls of the nave are intact, and the western entrance doorway as well as the lofty arch between the nave and chancel show some fine Norman mouldings. We must not omit to mention a charming public walk round the Castle, which was laid out and planted with beeches at the expense of Lady Powis in 1722. Mr. Forty, the Curator of the Museum, was the cicerone over the Castle and he explained to the members the various portions of it as well as its historical associations, and after a walk round the walls they went with him to the Museum, which, though small, is well arranged and contained a particularly good collection of fossils from the Ludlow strata. Mr. Forty was most kind and attentive and anxious to show everything and impart any information in his power respecting the history and interesting features of the town and neighbourhood, and all felt much indebted to him for the success of the expedition. On returning to our hotel we were not sorry to refresh the inner man, prior to leaving by the 3.5 train, returning via Monmouth and Chepstow. The weather was perfect, the scenery beautiful, and all seemed much gratified with their excursion to Ludlow.

Alfred's Tower.—The last excursion of the season took place on Tuesday, Oct. 20th, 1891, Alfred's Tower and Stourhead being the programme. Arriving at Bruton at noon a well-horsed break conveyed the members to the lodge gates, whence the key of the tower was obtained. The somewhat unintelligent guardian of the key remained at the base of the brick triangular-shape erection beneath the protection of the statue of Alfred the Great, whilst the members ascended the 221 steps leading to the top by the most southern of the three towers forming the angles of the triangle. The view from this great height was very grand (the Greensand hill of Kingsettle, on which the first proprietor, Mr. Henry Hoare, built the tower, being 800 ft. above sea level alone) embracing a very wide extent of country. An iron railing now much eaten away by exposure to many a storm, surrounds a stone platform, and looks as if a good push would send it down 150 ft. to the ground beneath. The clearness of the atmosphere characteristic of the present stormy weather enabled the eye to range far away to the distant hills of Wiltshire and Dorsetshire, the Mendip hills looking like an undulation, and Glastonbury Tor like a mere pawn on the chess board. By the aid of some useful maps, which one of the members, a promising young aeronaut, had with him, Bradley Knoll, White Sheet Castle, Mere and other church towers were distinguished, and the rich woodland of Stourton lay mapped out beneath. After a rapid descent and some ineffectual attempts to gain information from the guardian of the tower, the members descended the sloping combe to the pleasure grounds, passing the "Pump of St. Peter," an hexagonal erection formerly in Bristol but now covering the six sources of the Stour. Traces of the late gales were just visible in a beech tree down here, and a branch or two there, but generally this special locality seemed highly favoured, and the noble trees, oak, beech, cedars, hemlock, spruce and pines, which rise up in all their forest grandeur around the artificial sheet of water, seemed uninjured. The following motto over a summer house, "Procul O Procul, este Profani" warned off the sacrilegious foot of the trespasser and caused a hasty exit on to the village green. The Church being accessible, the tombs of the Stourtons (the figures as usual mutilated) were visited and some Latin inscriptions copied. The marble tomb of Sir Richard Colt Hoare, the celebrated historian of "Ancient Wiltshire," is in the churchyard to the E. of the church. A white marble sarcophagus has this inscription :

Hoc sepulchretum
Sibi et Posteris
Ricardus Colt Hoare
fieri curavit
Anno MDCCCXIX.

Would that the "Posteri" of this celebrated man had cared more for the magnificent estate handed down to them! Returning through the pretty village of Stourton, and passing in front of the house and its lordly portico, looking sad and forsaken as if a funeral had just passed through its portals, the members trundled back to Bruton in time to see the fine church, over which they were kindly shown by the Vicar, the Rev. H. T. Ridley, who pointed out all the architectural details; the remains of the rood loft staircases, the Berkely crypt, the Abbot's tomb in the churchyard, the double towers, &c., the evening light bringing out the beautiful proportions and ornamentations of the fine W. tower. And then the much needed dinner at the Blue Ball was done justice to before the return to Bath at 7.3 p.m. The day was perfect throughout, just the sort of autumnal day which brings out the scenery so well.

BYE-EXCURSIONS.

Three very pleasant Bye-Excursions were arranged, the first to Hinton Abbey, on Tuesday, April 28th, 1891. A saloon carriage, kindly provided for them by the G.W.R. authorities, conveyed 24 members and two visitors to Freshford by the 2.38 p.m. train. A short walk through the straggling village across the "Tyning," and a field called the "Fillet" led them to the ruins, where they were met by Mr. Foxcroft and Mr. Salisbury, the present tenant. The former had courteously offered to give them a description of the Abbey, and in the chapel, still remaining almost perfect, proceeded to give the members a brief resumé of a paper he had prepared, and recently read before the Bath Literary Club, on the Carthusian Priory of Hinton. Printed in full (*vide p.* 293).

Windsor.—The second took place on August 4th, 1891. Owing to the uncertainty attending her Majesty's movements, it was a long time before the much wished for excursion to Windsor Castle could be carried out. When, however, at last an announcement from the Lord Chamberlain informed the public that the Castle could be viewed on and after Bank Holiday till further notice a bye-excursion was at once arranged for the Tuesday following. Ten members only after all (with five visitors) answered the Secretary's summons to start by the 8.7 a.m., G.W.R. train, for Windsor. The expected delay on these occasions of course occurred, and Windsor was not reached till noon or after. Whilst the Secretary went to the Castle Hotel, to make the necessary arrangements for lunch, the members proceeded up the Castle Hill, by the Queen's statue, and entering the lower ward by Henry VIII's gateway, leaving St. George's Chapel on the left, procured the necessary tickets of admission from the Lord Chamberlain's stores, seemingly a pigeon hole presided over by a civil functionary. Armed with this permit, they presented themselves at the small portal leading into St. John's Tower, and were asked to wait their turn in a stone groined room somewhat like a guard chamber. After an interval allowed them for reflecting on the loss of their individuality in the crowd of "trippers," amongst which it was evident they had soon to mingle, a seedy looking official, somewhat like a waiter, at last conducted them up an ancient staircase to the Vandyck room, the first entered of the "State Apartments." The great crowd admitted at one time (there must have been nearly a hundred), the bad light, and the indistinct uneducated utterance of the showman, rendered it very difficult to see these fine pictures of the great portrait painter to advantage. One could but glance at them, halt for a space before the celebrated picture of Charles I, over the fireplace, taken in three positions, front, profile, and three quarters, for Bernini, the Roman sculptor, from which the bust, afterwards destroyed in the fire at Whitehall, 1697, was executed—and then be hurried on to admit another crowd following closely on our heels—this was perhaps necessary however inconvenient to those who wanted to study these masterpieces—as 2,750 were passed through these apartments on the previous day. Next came the Zuccarelli room, with its nine large paintings by that master; the celebrated "Meeting of Isaac and Rebecca," and the seven landscapes on the opposite wall were all hurried over, and so on throughout. Next the State Ante-room, with the alcove and its stained glass portrait of George III, in his coronation robes, by Sir Joshua Reynolds; this, formerly Charles II's public dining-room, is appropriately decorated with birds, beasts and fishes, the work of that master of wood carving, Grinling Gibbons. Through the Grand Vestibule, where glass cases protect and hide from view the mass of presents presented to the Queen on her Jubilee, and into the fine Waterloo chamber, built by Sir Jeffrey Wyatville, the walls of which are covered with Sir Thomas Lawrences *chefs d'œuvres*, painted for George IV, and representing the portraits of the then reigning sovereigns of Europe—a really noble, lofty and well lighted room. Then came the Throne room, its ceiling painted by Verrio, and its walls lined with embossed Garter-blue velvet, and the cognizance of that Order everywhere represented, for here are installed the Knights of that most noble Order. The carved ivory throne however had been removed elsewhere on account of certain repairs then in progress. The Reception room came next, with the Gobelin tapestry whereon the story of Jason and Medea was wrought in wondrous needlework, and the fine Malachite vase reminding one of the gift of Nicholas, Emperor of all the Russias; thence into St. George's Hall, glittering in gold, scene of the late reception of the Emperor of Germany, rather long for its proportion, but well suited for royal banquets. Portraits of the Kings of England, from James I to George IV, decorate its walls, over them wave the banners of the Knights of the Garter, whose coat of arms ennoble the roof, and whose names from Edward III to the most recently created Knight are painted on the panels of the S. window. Finally passing through the Guard chamber, full of interesting relics of former wars, amongst them a chair made from an elm tree which grew on the field of Waterloo, and called *l'arbre de Wellington.* The indistinctness of the guide here reached its climax, and the members were not sorry to escape from the crowd and crush and regain the outer air. The Round Tower, originally built by William of Wykeham, on the artificial mound raised by the Norman kings, was next visited, some 200 steps led to the summit, from which a magnificent view of the surrounding country was obtained—the winding Thames, Eton's Chapel and playing fields, and the long walk in the foreground. Crossing the court yard and descending a few steps on to the N. Terrace, extending 1,870 feet from the Brunswick Tower, on the E., to the Winchester Tower on the W., the "*Hoc fecit Wykeham*" on the latter raised the question as to which noun was the nominative case to the verb—a query suggested by the architect's reply to his royal master, King Edward III. The rain which now began to fall obscured the fine view of Home Park and Castle slopes, and the members, retracing their steps through the lower ward, were glad to take shelter in St. George's Chapel. The whole of the building with the exception of the N. aisle seems to be thrown open to the public, who can wander about and admire this celebrated specimen of architecture without the annoyance of the uneducated and indistinct utterance of a seedy showman. The choir, of course, was the chief point of interest, as the members stood over the vault containing the remains of Henry VIII and one of his Queens, Jane Seymour, Charles I and other Royal personages. The view of the Perpendicular stone tracery of the roof, the colours of the memorial window, and the richly carved woodwork was very striking. On right and left are the stalls of the Knights of the Garter; their banners, recently taken down and dusted for the visit of the Emperor of Germany and the Royal wedding, contrasted strongly in the brightness of their appearance with the dusty-looking surcoat, helmet and sword hanging beneath them. The brass plates on which are inscribed the names and titles of the knights gleamed out from the back of the dusky stalls; two, one on each side, remained still to be occupied with the insignia of the last-made knights. On the N. side is the Closet for the Royal household high up on the wall of the choir; and beneath, in the N. aisle, is the black marble slab covering the tomb of "King Edward IV and his Queen, Elizabeth Widville." The Braye Chapel, forming the S. transept, contains the white marble tomb of the Prince Imperial erected by the Queen; at the W. end of the N. aisle is the elaborate monumental sculptured story of the Princess Charlotte's death; and on a pillar adjoining the brass tablet to the memory of Prince Alamayn, son of the King of Abyssinia. Standing at the W. doorway a good view was obtained of the Horseshoe Cloisters, built by Edward IV in the form of a fetter-lock, the Curfew Tower in the background, and the fine flight of steps leading up to the W. entrance of the Chapel. There remained now to be seen the gem of all. Leaving by the N. door, and passing the houses of the Minor Canons and through the Cloisters, the passage at the E. end of the Chapel was entered. Leaving the dripping umbrellas here and passing through a temporary spring door, the far famed Albert Memorial Chapel, built over the Royal tomb house, burst upon the view in all its rich magnificence. The costliest productions of the sculptor's and decorator's arts are here lavished to keep ever green the memory of the dearest and the best. Immediately on entering comes the white marble effigy of the Duke of Albany, the work of Boehm; to the E. of this the cenotaph of Albert the Good, by Baron Trequite, in the whitest of Carara marble; round the walls are the same master's exquisite panel representations of Biblical stories, the figures and accessories incised in marble and filled in with various coloured cements (Tarsia-work) most chaste in design. The roof glittering with Salviati's mosaics; the richly coloured glass in the windows, and the floor in different coloured marbles all surpass description. The last restorations have been nobly carried out by Sir Gilbert Scott, and the Chapel is probably surpassed by few ecclesiastical memorials in any part of the world.

After lunch at the Castle Hotel, the members left in a break for a drive down the Long Walk and to Virginia Water. Entering from Park Street, near the iron gates leading to the Castle, they turned to the right and drove down the finest avenue of elm trees in the world. Straight as an arrow, but undulating in accordance with the gently swelling nature of the surface, it continues for nearly three miles to an eminence called Snow Hill, on which the equestrian statue of George III, by Westmacott, is erected. The elm trees, originally planted by Charles II, 1680, are showing signs of age, and the gaps are being gradually filled up by new plantations of lime and other kinds. The rain, which threatened to spoil the drive, now began to show signs of abatement, and turning to the left near Cumberland Lodge and Virginia Water they passed midway on the right hand the equestrian statue of the late Prince Consort, erected by the Queen, on Smith's lawn, from a portion of the fund of the Women's Jubilee Offering. On the left, just before descending the hill leading through the wood, are the remains of one of the old forest trees carefully propped up and cared for by her Majesty's command. Leaving the break at the Blacknest gate, the members walked along the S. bank of Virginia Water, the largest sheet of artificial water in England, 150 acres in extent and over two miles in length; saw the Fishing Temple on the opposite side, looked in at the ruins, consisting of Corinthian pillars of Roman origin taken from Tripoli in 1825, and re-erected by Wyatville to represent the ruins of an old temple in a picturesque corner of the woodland, backed by some fine Scotch firs. The pillars are monoliths of red granite and a marble altar records that it was dedicated by Publius Aurelius to Jupiter Helios. Onwards to the cascade, artificially made of large blocks of quartzite from Bagshot heath, over which the water from the lake falls and runs into the Thames, and turning into the Southampton Road, the break was remounted at the "Wheatsheaf" and returned to the forest through Englefield Green, passing Holloway College on the right, and by the residences of many wealthy families on the way. Windsor Station was reached at 6 p.m. and Bath 9 p.m., after a successful day.

Silchester.—Upon information that the excavations had again been re-commenced by the Committee of the Society of Antiquaries the third excursion was promptly arranged for Silchester on Tuesday, September 29th, 1891. Twelve members only out of eighty-six mustered at the Bath Station for the 9.52 train to Mortimer. Arriving at the latter station (their number being increased by two more at Reading) at 12.15, carriages were in readiness to convey them at once to Silchester, a distance of three miles, through a prettily-wooded country. Arrived at the scene of the operations, where great mounds of freshly-excavated material indicated the progress of the work, they were admitted through a wicket-gate on the left of the road running through the city from E. to W., after the payment of sixpence a head to the Lord of the manor as toll, and found themselves at the hut now erected to the W. of the Forum as a temporary receptacle for the "finds." Mr. St. John Hope here met the members, but as the much-needed mid-day refreshment was then in progress, a traverse was made across the city to the S. gateway for an inspection of the portion of the walls on that side to pass the time. On the inside of the wall, some distance to the E. of the gateway, a sort of square buttress attracted attention. The character of the Roman work was well shown here, consisting of bands of Green sandstone and flint, some of the flint courses showing herring-bone work. Amateur photographers were busy at this point, and it is hoped were successful in reproducing a facsimile of this interesting masonry. A similar projection on the opposite side, close to the N. gateway, and on the E. side of it, caused a slight discussion as to its object—Were these abutments intended to strengthen the walls? or were they platforms for the balistæ or other weapons of defence? as Mr. Green suggested. An hour having been now spent in walking round and over the S.W. and N. portions of the city walls, the members assembled round a table, whereon was a plaster model of the last villa in process of excavation, and listened to Mr. S. E Fox, F.S.A., whilst he explained—with the aid of a plan of the city laid out before him—the work now in progress. Originally the site of a Celtic *oppida* (he said), that people had fortified, the portion of table land running into the valley like a broad tongue, with an earthen rampart; the N. being the weakest side, and that from which they expected an attack, was defended by an outer line of entrenchment, which ran round some distance to the W. But the ground gradually sloping regularly away on the S., this outer entrenchment was not needed so far from the original stronghold. The Romans coming after adapted this *oppida* for their own uses. Sloping away the outer face of the rampart they built their walls upon it, levelled a space outside the N. and W. walls for better purposes of defence, and made use of the Celtic gateways and British trackways leading from them, N., S., E. and W. This adaptation of the old roads will account for the fact that the Roman *viæ* do not divide the city into regular rectangular spaces *more Romano*, but follow more or less the site of the former ways; the British gateways were partly filled up and narrower ones inserted, the nine-sided form of the older *oppida* was accepted and the Romans laid out their city in squares, regardless of the outer lines of the walls. Villas or houses appear to have been erected at the corner of each of the squares; thus the whole enclosed space was more like a large village than a city, though we know from the remains of the Forum, with its line of shops, and the Basilica on the W. side, formerly discovered, that it was under municipal government. Baths have been found on the S.W., but from their small size Mr. Fox thought that larger ones had yet to reward the search of the antiquary. Besides the circular temple found by the late Mr. Joyce, they last year found remains of two others on the S.W., the cella of one being about 50 feet square. These temples appear to differ from the usual classical form, but are similar to those found in the W. of France. Mr. Fox then pointed out by the aid of the model before him the different details of the house they had just cleared of debris; it was one of those built at the corner of a square and to the W. of the Forum. It was apparently a small one, with the usual hypocaust and a corridor running to the S., along which were arranged a series of small shops; it had its ash-pit and a detached square room, the purposes of which even the imagination of an enthusiastic antiquary had not yet fathomed. Mr. Fox then took the members to the temporary museum where the recent "finds" were shown and a most interesting collection it was. Elegant earthenware pots with ornamentation rather Celtic in character; Samian ware embossed with various classic scenes, the Segontian Hercules, of course being represented as one would expect in Segont, the city of the Segontiaci; necks of green glass vases, portion of the antler of a red deer and many other usual Roman remains, amongst them Roman coins from the earliest to the latest period, and above all three British coins found this year; but one thing above all Mr. Fox prized, a portion of foreign marble which, if his surmise as to its locality be correct, was the largest piece of that sort of marble yet found in Britain. This may mark the visit of the Club on Tuesday, as the discovery of a Roman eagle, on the very day that the Club visited Silchester, marked the 9th October, 1866. It now only remained to visit the Museum over the way, where some of the earlier "finds" are housed, and under the guidance of Mr. St. John Hope, to walk along the *antiquas vias,* see the destruction that the weather of one winter has already done to the remains, speculate how long our own Roman remains will stand the destructive effects of the weather if left much longer uncovered; and wander on to the fine amphitheatre outside the walls to the N.E. Here the carriages were met, and the members, after a ten mile drive to Reading, arrived there in time for a 4.30 p.m. dinner at the Queen's Hotel.

It may be stated here that all the "finds" will ultimately be placed in the Museum at Reading, together with an architectural model of the city. The Society of Antiquaries deserve the support of the public in their work.

Of Walks there is nothing to record, though rumour reaches me that two of our members still continue their twenty mile perambulations every week, the only result, so far as one knows is that they have fairly distanced and exhausted all other competitors, and they two remain the pedestrians of the Club.

The recent "Black Winter" which has carried off so many great and good men has dealt very leniently with our members; two only have disappeared from our list; the most recent removal being that of Captain Lysaght, one who joined our ranks many years ago, and who so long as his health and walking powers remained was frequently present at our excursions, walks and meetings, contributing much by his geniality to the social aspects of the Club—Botany was his particular pursuit. The second: F. J. Walker, Esq., of The Priory, Bathwick, was up to quite recent days a very familiar object to the members; his general acquaintance with most of the objects for which the club was founded, his travelled experience, and unbounded and exhaustless good nature contributed much to the instruction and amusement of the members in their excursions and walks. His strongly built frame and great walking powers indicated a longer enjoyment of health than was granted him. His presence will be missed by us.

Seven new members have been elected since last Anniversary, and two, Col. Heywood and the Rev. Hayes Robinson, placed on the Supernumerary List; the members (eighty-seven) remaining about the same as during the last few years.

A communication was received during the year from the Secretary of the Cardiff Naturalists' Society, with reference to the recent wanton destruction of sea birds at Grassholme Island, asking the Club to support the bill promoted by Mr. E. A. Pease, entitled a "Bill to Assist the Wild Birds' Protection Act, 1880." This was done by the signature of your President and Secretary, on behalf of the Club, to a petition for that purpose.

Your Secretary, appointed as Delegate to the Corresponding Societies Committee of the B.A. at Cardiff, presented the following Report to the October quarterly meeting:—

Your delegate attended two meetings of the Corresponding Societies Committee at Cardiff. The first was held on Thursday afternoon, Mr. G. J. Symons in the chair, and was largely attended. Reports from the different committees of sections were presented and adopted. Dr. Vachel, President of the Cardiff Naturalists' Society, drew attention to the recent wanton destruction of sea birds on Grassholm Island, and stated that his society in conjunction with several other societies (our own society being one of these) had petitioned Parliament in favor of the preservation of bird's eggs during the breeding season, but that Mr. Pease had been unable to bring his bill before the house during the recent session. Mr. Kermode, the Isle of Man delegate, offered to send Dr. Vachel a copy of the Act which they had passed for the protection of birds eggs.

The delay in the issuing and the difficulty and cost in obtaining the Maps of the Ordnance Survey caused a long discussion, Mr. Peter Price commenting on the fact that notwithstanding the great increase in the population and extent of Cardiff, the Ordnance Map of that district was ten years old. Several suggestions were made, and photography was advocated as a method whereby cheapness and expedition in the issue might be obtained. The maps brought out in foreign countries were alluded to as examples that might well be copied. The committee for cataloguing pre-historic remains suggested that on the discovery of such remains a communication should be sent to the committee, so that the residents in the locality may be assisted and directed in their efforts. The meeting was adjourned to Tuesday, when the delegates again met at 1 p.m., under the Presidency of Mr. Symons. The report of the various sections were taken seriatim; from section A. Dr. Mill reported that many observations had been taken by local societies on the temperature variation in lakes, rivers and estuaries, and that the Cardiff Naturalists' Society had distinguished itself in this respect by observations on the river Taff. From Section B (chemical section) came some remarks on the desirability of observing the effect of fog on plants, and from Section C a report on the satisfactory progress of geological photography. It was hoped that in course of time a systematic photographic record of the principal features in the geology of the country would be collected together. A large number of these photographs, the result of last year's work, was exhibited in Section C. Your delegate regrets that only one had been sent up from our Club. This was a very good one, taken by Mr. Powell, of the Inferior Oolite beds lately opened up at Midford during the progress of widening the line, and has been registered under the number 589. Many other subjects were discussed, e.g., the erosion of sea coasts, the disappearance of native plants, and a recommendation from Section D adopted, "That a Committee be appointed to take steps for the future legislative enactment for the preservation of wild birds eggs." Some of the delegates discussed the best way of spreading the knowledge of natural history amongst our school children and instanced the "Dickey Bird" Society as doing good work in that direction. Specimens of an illustrated paper, in which 150 figures of birds had already been represented by a cheap process was shown, and the beauty and softness of the figures much admired.

It had been hitherto customary for the delegates to dine together on some early day during the meeting, but on this occasion a very pleasing departure was made from this custom. The members of the Cardiff Naturalists Society invited the delegates to supper on Friday, August 21st, after Professor Miall's evening lecture. The invitation was readily responded to, and some forty or fifty delegates and members of the Cardiff Society spent a very social and pleasant evening together under the Presidentcy of Dr. Vachel. Specimens of Welsh music were given on the Welsh harp by Mr. William Morgan ("Alaw Ddu,") a winner of the prize at the Eisteddfod, just held at Swansea, and some songs from local female vocalists. The President alluded in a graceful speech to the unique occasion in the history of the town of this assembly of representative naturalists from so many societies, and gave them a cordial welcome to Cardiff, and exhorted them to keep alive in their various localities the study and pursuit of Natural History. Mr. Thomas gave an example of the native language in a sonorous Welsh speech, which he translated afterwards for the advantage of the Saxon guests, and Mr. Symons returned thanks on behalf of the delegates for this graceful welcome.

Many valuable additions have been made to the Library from those Societies with whom we exchange publications; and several of the missing back numbers have been most generously given to us by the Cotteswold and Cardiff Naturalists' Clubs and by the Royal Institution of Cornwall. A complete set of our Proceedings, so far as they exist in print, has been given to the Archæological Institute for several back numbers of their journal to make the sets in the Institution Library complete—the authorities of the Institution agreeing to permit the members of our club (in consideration of this gift) to have access to, and the use of, the journal of the Archæological Institute in the Conversation Room. The Library of the Club, hitherto upstairs, by a new arrangement has now been placed on shelves set apart for that purpose by the Committee of the Institution in the Conversation Room, to which members of the Club are permitted free admission.

The Treasurer's account shows a balance in hand from the year's receipts and expences of £14 7s. 1d.

The album has had many additions during the past year from Dr. Mantell and Mr. Powell, the amateur photographers of the Club, and will in course of time afford a valuable collection of photographs of the archæology and geology of the neighbourhood.

It now only remains for me to bid farewell to you, Sir, and the other members of the Club, this being the last time that I shall draw up the summary of the year's Proceedings as your Secretary; elected to that post on February 16th, 1863, hitherto supported by your counsel and advice, and receiving valuable aid and assistance from the Treasurer and other Officers, the duties have been cheerfully undertaken. The time has now come, after 29 years of office, when the work becomes too irksome for me—*non sum qualis eram.* It is well, moreover, that new spirit and fresh energy should be given to the post. The Rev. W. W. Martin, an old member of the Club, has kindly undertaken the office. Your interests will doubtlessly be well looked after by him, and the scientific character, as well as the social pleasures of the Club maintained with unabated vigour. May my successor, when his term of office expires, look back with as much pleasure as I do to many happy days spent and pleasant acquaintances made in your company!

H. H. WINWOOD,
Hon. Sec.

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PROCEEDINGS

OF THE

BATH NATURAL HISTORY

AND

ANTIQUARIAN FIELD CLUB.

VOL. VII., No. 4.

1893.

BRITISH MUSEUM
NATURAL HISTORY.

PRICE HALF-A-CROWN.

BATH:
PRINTED (FOR THE CLUB) AT THE HERALD OFFICE, NORTH GATE.
1893.

On some Deep-Well Borings in Somerset and elsewhere. By H. H. Winwood, F.G.S.

(Read 1st February, 1893.)

The question of the water supply to our large towns is a very important one, becoming more and more serious every year as the population increases and as the demand becomes greater and greater. The various schemes lately considered in our own city for an increased quantity of this necessary element indicates how much it concerns ourselves. It therefore seemed to me that a record of a *deep* well boring in our city would be useful in the pages of our Proceedings, together with an account of several others in our County furnished me by Mr. Whitaker of the Geological Survey. You may have noticed that I said "*deep*-well borings," the surface springs and shallow wells upon which our supply formerly depended are now found insufficient for many reasons; in the first place, owing to the cultivation and consequent drainage of our soil, together with the deforesting of our lands, the rain fall which formerly percolated gradually down to some water bearing stratum is now carried off rapidly to our rivers and onwards to the seas; flooding the local plains by its sudden rush and overflow, carrying with it the surface soil and often leaving bare rock behind. The rain, too, of late years seems to have fallen at the wrong time of the year, when the sun is at its greatest height and the vegetation most luxuriant, so that the larger portion of the moisture is quickly evaporated, only a comparative small quantity going to supply the springs, our autumn and spring rains being markedly deficient. Then again the very fact of the manuring of the lands, rendered necessary to meet the growing wants of an increasing and dense population, causes contamination in our shallow wells and forces us to sink deeper and deeper for a purer supply. Hence the importance of the question, where shall we bore ? both from an economical and especially a geological point of view.

In that valuable paper contributed by our late member, Charles Moore, to the Geological Society of London, on the "Abnormal Conditions of Secondary Deposits," Q.J.G.S., vol. xxiii, p. 495, there is a description of a deep sinking in Kingsmead Street, in 1838, to supply the needs of Pinch's brewery, and a section given of the beds passed through. This attempt came to an unsuccessful termination, not from the want of water, but from certain troubles arising from the Bath Corporation rights over the hot springs, or the supposed infringement of those rights. That was the first deep boring recorded in our district. A second boring has recently been made, and this it has been my good fortune to witness by the courtesy of the late manager of the Bath Brewery. The site is on the E. side of Bathwick Street in the Brewery yard. A well some 13ft. deep already existed, and when I first visited the place in August, 1891, the boring rod had penetrated some 40ft. from the surface, and was, as I expected, in Blue Lias clay. The boring was undertaken by Messrs. Isler & Co., of Southwark, and John Messent was the intelligent foreman conducting the work. The boring was done by a chisel 6¾in. broad, and the scoop which brought up the debris was 6in. diameter. The rods varied in length from 10ft. 6in. to 4ft. 2in. From the nature of the tools the results were not so satisfactory from a geological point of view as would have been the case had a diamond drill been used, when the cores come to the surface whole ; but the scoop brought up sufficient material to indicate, after washing, the general character of the beds passed through.*

SPURWAY'S WATER WORKS.

During the reading of the former notes I alluded to some trial sinkings then in progress at the back of Crisp's farm, on the S. slopes of Lansdown; as several interesting sections have been since exposed a description of them may be valuable before all traces are obliterated by the filling in of the excavations. Two have been sunk in the same field as the Reservoir for the water works, between the latter and an Inferior Oolite quarry on the slope above. A third in a field adjoining, to the W. of the Reservoir, and somewhat lower down. All three are in the "Midford Sands." No. 1, that to the N.E. of Reservoir, has gone through the sands to the blue clay. No. 2, in the same field to the N.W., has only reached the base of the "Sand burrs." No. 3 has just touched the top of the blue clay.

---

* Unfortunately the details of the boring are not permitted to be given.—H. H. W.

WELL SINKING NEAR SPURWAY'S RESERVOIR IN FIELDS AT THE BACK OF CRISP'S FARM, S. SLOPE OF LANSDOWN.

No. 1 Sinking.

N.E. of and about 90 paces above Reservoir. 80ft. below bottom bed of Inferior Oolite now visible in quarry above.

	Thickness.		Depth.	
	FT.	IN.	FT.	IN.
1.—"Brash" surface wash ...	3	0	3	0
2.—"Midford Sands" and "Sand burrs"	15	0	18	0
3.—Brown iron-shot limestone, oolitic, with rounded pebbles, and patches of grey marly limestone at base. Highly fossiliferous, and resting on grey marl	1	6	19	6
4.—Light blue clay, with band of blue dense rather micaeous limestone (4in.) near top ...	13	0	32	6

No. "3" is a well marked bed, and may truly be called a "Cephalopoda bed," being full of Ammonites and Belemnites; the following have been identified through the kindness of Messrs. Newton and H. B. Woodward, of the Geological Survey:—*Ammonites communis* and *A. bifrons.*

Water was found on breaking through this latter bed.

No. 2.

About 132 paces N.W. of No. 1, and a little higher up.

Surface soil, "Midford Sands" and "Sand burrs" 30ft.

From these "burrs" I obtained a fine, though not perfect, specimen of *Lima toarcensis*, now in the Jermyn Street Museum.

Water rose here to a depth of from 4 to 5ft.

No. 3.

At a still lower horizon than No. 2 in a field adjoining to the S.W.

	Thickness. Ft.	In.	Depth. Ft.	In.
1.—Surface soil	0	6	0	6
2.—"Midford Sands" and "Sand burrs"	15	0	15	6
3.—Iron-shot conglomeratic bed, similar to "3" at No. 1, highly fossiliferous, resting on greyish marl ...	1ft. to 9in.		16	6
4.—Light blue clay just touched				

From the "Sand burrs" Mr. Newton identified *Ammonites radians*, and from "3" similar in every respect to the same numbered bed at the first sinking the following—

Ammonites communis, A. bifrons, Rhynconella Moorei.

Water just oozing up under iron shot bed.

Some six or seven trial holes have lately been sunk at Monkswood in connection with the contemplated extension of the Reservoir; and through the civility and assistance of Mr. Charles Gilby I am enabled to give the following particulars.

The height above Ordnance datum are entirely due to Mr. Gilby's observations; the depth of the holes and the thickness of the beds have been verified by myself.

No. 1.	Height above Ordnance datum. Ft.	Thickness. Ft.	Depth. Ft.
In the W. corner of the field adjoining Fry's farm	369·50		
1.—Surface Soil "Midford Sands" and Sand burrs at base		20	20
2.—Yellow clay followed by light blue clay		3	23

	Height above Ordnance datum. Ft.	Thickness. Ft.	Depth. Ft.
No. 1A.			
About 45yds. W. of No. 1.	363·73		
1.—"Midford Sands" and "Burrs" at base		8	8
2.—Yellow clay followed by light blue clay		3	11
No. 2.			
About 106yds. to the E. of No. 1. ...	365·09		
1.—Surface soil, "Midford Sands," and "burrs" coming in about 18ft. down		18	18
2.—Sand "burrs"		9	27
3.—Conglomeratic iron-shot beds with Celphalopoda (Ammonites and Belmenites)		5	32
No. 3.			
About 60yds. S.E. of No. 2, and at the bottom of field just N. of the brook	325·26		
1.—"Midford Sands"		7	4
2.—Light blue clay with thin band of blue dense rather micaceous limestone		4	11
No. 4.			
About 50yds. S. of No. 3, and on N. of brook	322·46		
1.—Peat and shelly marl alluvial ...		19	19
2.—Stiff light blue clay with occasional bands of thin blue Lias ...		10	29
3.—Boring carried down 16ft. lower, still in light blue clay, with occasional bands of blue limestone from 8in. to 14in. thick. Borer at bottom still in blue clay		16	45

Nos. 5, 6 and 7 are not of any importance, except that at No. 5 about 55yds. S.W. of No. 4 the alluvial deposit thins out on the upward slope to 10ft., and rests immediately upon the light blue clay as at No. 4, the blue clay being here sunk through to a depth of 3ft.

In every case the strata is similar to that at Crisp's farm on the S. slope of Lansdown. The sands are succeeded by the "burrs," these by the iron-shot fossiliferous beds containing the characteristic Upper Lias Ammonites. Whether the light blue clay below is of Upper or Lower Lias age is doubtful, I am inclined to think it is the former.

Notes of some Somerset Wells. By W. Whitaker, B.A., F.R.S., F.G.S., Assoc. Inst. C.E., *and* Horace B. Woodward, F.G.S.

Where not otherwise stated the figures stand for feet.

[Remarks in square brackets have been added by the authors.]

Bedminster. Ashton Gate Brewery.

Made and communicated by Messrs. G. Isler & Co.

No supply.

		Thickness.	Depth.
	Shaft (the rest bored)	—	43½
[? Valley Drift]	Sand	2½	46
[Trias]	Red bind	5	51
	Red and blue bind ...	4	55
	Marl, very binding ...	4	59
	Red stony marl ...	7	66
	Hard red stone ...	5½	71½
[Coal Measures ?]	Iron band	3¼	74¾
	Spar and hard sandstone	1½	76¼
	Red mixed marl ...	2	78¼
	Shaly marl	5	83¼
	Dry gault [clay] ...	2½	85¾
	Pit down	4¼	90
	Mixed stone	2¼	92¼
	Red shaly marl ...	2	94¼
	Hard stone	1½	95¾
	Stony marl	1¼	97
	Pit down	3½	100½

CURRY RIVELL. Hambridge Mills. 1873

Communicated by MR. E. W. WYATT. All Lower Lias.

	THICKNESS.		DEPTH.	
	FT.	IN.	FT.	IN.
Dark blue clay ...	121	1	121	1
Blue lias rock ...	0	11	122	0
Clay	42	3	164	3
Blue lias rock ...	0	9	165	0
Clay	3	0	168	0
Rock	1	0	169	0
Clay	21	10	190	10
Rock	1	2	192	0
Clay	1	5	193	5
Rock	1	7	195	0
Clay	7	6	202	6
Rock	1	6	204	0
Clay	1	3	205	3
Rock	0	9	206	0
Clay	0	3	206	3
Rock	1	9	208	0
Clay	0	0½	208	0½
Rock	1	1	209	1½
Clay	0	0½	209	2
Rock	0	10	210	0
Clay	0	2	210	2
Rock or Hard clay ...	0	10	211	0
Clay	0	1	211	1
Rock very hard ...	2	2	213	3
Clay	1	0	214	3
Rock	1	9	216	0
Clay	1	3	217	3
Rock or Hard clay ...	1	9	219	0
Clay, &c.	23	9	242	9
Rock				
Clay	7	0	249	9
Rock	1	6	251	3
Clay	2	0	253	3
Shale	0	9	254	0
Clay	2	9	256	9
Rock	1	10	258	7
Clay	4	0	262	7
Shale	1	2	263	9

	Thickness.		Depth.	
	Ft.	In.	Ft.	In.
Clay	2	0	265	9
Rock and Shale ...	2	3	268	0
Clay	0	3	268	3
Rock or Shale ...	1	9	270	0
Clay	1	0	271	0
Rock	0	7	271	7
Clay	2	0	273	7
Rock	0	8	274	3
Clay	5	0	279	3
Rock and Shale ...	3	2	282	5
Clay	2	0	284	5
Rock and Shale ...	2	9	287	2
Clay	2	6	289	8
Rock	1	7	291	3
Clay	4	6	295	3
Rock	1	8	296	11
Clay	0	3	297	2
Rock ... about	1	0	298	2
Rock Shale ... about	5	0	302	2
Clay, lighter than beds above	6	0	309	2
Hard rock. Boring continued to about			310	0

Harptree. Trial boring, 1876, 1877.

Communicated by Col. Sir F. Bolton.

		Thickness.		Depth.	
		Ft.	In.	Ft.	In.
[Trias]	Brown clay	14	0	14	0
	Red and blue marlstone	66	6	80	6
	Grey sandy do. ...	2	8	83	2
	Red and blue do. ...	8	11	92	1
	Grey sandy do. ...	0	6	92	7
	Red and blue do. ...	3	2	95	9
	Grey sandy do. ...	2	8	98	5
	Red and blue do. ...	116	9	215	2
	Dolomitic Conglomerate	32	2	247	4
[Coal Measures]	Sandstones and shales with coal ...	348	8	596	0

LANGPORT. Mr. W. Davis (1880 or before.)

Boring, made and communicated by MESSRS. LEGRAND & SUTCLIFF. Water-level 4ft. down, in July, 1878. Yield 9 gallons a minute.

		THICKNESS.	DEPTH.
Made Ground	Made earth	5	5
	Made earth and stone	4	9
[? Alluvium]	Peat bog	4	13
	Light [coloured] clay	15	28
	Dark clay	12	40
	Peat bog	12	52
[? Re-assorted Keuper Beds]	Light-red marl, with small pebbles	16	68
[Trias (Keuper Beds)]	Blue stone	2	70
	Gypsum	2	72
	Red marl	2	74
	Marl and gypsum	1	75
	Red marl	3	78
	Gypsum	½	78½
	Blue stone	2	80½
	Red marl	7½	88
	Gypsum	1	89
	Red marl	1	90
	Gypsum	6	96
	Gypsum and red marl	8	104
	Red stone and marl	2	106
	Red slate [shale ?]	3	109
	Slaty [shaly ?] marl and gypsum	5½	114½
	Hard red slaty rock [shaly ?]	3	117½
	Red marl and gypsum	109	226½
	Stone and red marl	3	229½
	Red and blue marl and gypsum	28½	258

In the lower 190ft., about half of the work was through soft beds, and half through hard beds.

SHEPTON MALLET. Messrs. Garston, Hill & Co.

Made and communicated by MESSRS. G. ISLER AND CO. No water.

	THICKNESS.	DEPTH.
Shaft (the rest bored)	—	50
Blue Lias and stone	30	80
Very hard stone [? Lias]	18½	98½

SOUTH WIDCOMBE. 1875-1877.

Boring, communicated by COL. SIR F. BOLTON.

		FT.	IN.
Trias (Keuper Beds)	Red marl	183	0
	Dolomitic Conglomerate...	27	10

TAUNTON. Rowbarton Brewery.

Bored throughout, and communicated by MESSRS. G. ISLER & CO. Water-level 15ft. down. Supply abundant.

		THICKNESS.	DEPTH.
[Trias (Keuper Beds)]	Loamy marl	12	12
	Blue marl	6	18
	Red marl	15	33
	Blue marl	10	43
	Brown marl	4	47
	Solid blue marl ...	16	63
	Brown and blue marl ...	8	71
	Solid red marl ...	7	78
	Blue and red marl ...	4	82
	Solid red and grey marl	11	93
	Blue, grey and brown marl	10½	103½
	Brown and grey marl ...	3	106½
	Solid brown marl ...	2	108½
	Brown and grey marl ...	23½	132
	Solid brown marl ...	25½	157½
	Brown marl	4	161½
	Brown and blue marl ...	5	166½
	Brown marl	2½	169
	Brown marl with traces of gypsum	3	172
	Brown marl	9	181
	Brown and blue marl ...	13	194

TAUNTON. West Somerset Brewery. 1885.

Bored throughout, and communicated by MESSRS. G. ISLER & CO. A sluggish supply of water at 100 feet.

		THICKNESS.		DEPTH.	
		FT.	IN.	FT.	IN.
Stony made ground		4	0	4	0
Coarse ballast [River Gravel] ...		4	0	8	0
[Trias (Keuper Beds)]	Red marl	20	0	28	0
	„ „ and sand ...	12	0	40	0
	Gypsum	7	0	47	0

		THICKNESS.		DEPTH.	
		FT.	IN.	FT.	IN.
[Trias (Keuper Beds)]	Red marl and gypsum ...	5	0	52	0
	,, ,, ...	7	6	59	6
	,, ,, and gypsum ...	7	0	66	6
	,, rock	4	0	70	6
	,, ,, and gypsum ...	7	0	77	6
	Hard marl	2	0	79	6
	,, ,, and rock ...	3	6	83	0
	Rock	6	8	89	8
	Hard marl and gypsum	9	10	99	6
	Mottled marl... ...	1	6	101	0
	Red ,, ...	4	0	105	0
	Brown ,, ...	31	2	136	2
	,, ,, and gypsum	3	9	139	11
	,, ,, ...	8	6	148	5
	Red ,, ...	3	6	151	11
	Grey ,, ...	3	8	155	7
	Brown ,, ...	29	6	185	1
	Grey ,, ...	2	0	187	1
	,, rock-marl ...	3	6	190	7
	Brown marl	11	11	202	6
	Grey sandstone ...	4	3	206	9
	Brown marl	21	10	228	7
	,, ,, and gypsum	5	5	234	0
	,, ,, ...	4	7	238	7
	,, ,, and gypsum	57	2	295	9

WRINGTON. West Hay (Maj.-Gen. Harrison).

Made and communicated by MESSRS. A. WILLIAMS & Co.

Water-level 28ft. down.

		THICKNESS.	DEPTH.
[Valley Drift.]	Clay	4	4
	Gravel	5	9
[Trias]	Clay and stone ...	4	13
	Rock	2	15
	Clay and stone ...	8	23
	Hard clay	19	42
	Clay and stone ...	15	57
	Sandstone and clay ...	27	84
	Red sandy marl ...	4	88
	Sand and hard clay ...	5	94
	Limestone	6	102

Summary of Proceedings and Excursions for the Year 1892—93.

By the Hon. Sec.

MR. PRESIDENT AND GENTLEMEN,

The year commenced on February 18th, with the usual Anniversary meeting, Col. R. L. Taylor in the chair, and after all the usual routine business had been transacted, and a vote of thanks unanimously passed to the Treasurer for his efficient services, on his announcing a balance to the credit of the Club of £14 7s. 1d. on the year, the resignation of the Rev. H. H. Winwood, as Hon. Sec., was accepted with great regret, and it was unanimously decided to present him with a small token of the esteem and gratitude of the members of the club. A sum of £25 from the funds of the club was voted towards the purchase of a suitable object, the selection of which was left to the decision of the committee. This article was subsequently selected to be a Petrological Microscope, designed and patented by Mr. Allan B. Dick, and manufactured by Messrs. Swift and Son, of 81, Tottenham Court Road, with its necessary fittings and adjuncts.

At an afternoon meeting on March 16th, largely attended by members of the club, and lady visitors, the chair was taken by Mr. H. D. Skrine, the Chairman of the Field Club.

The CHAIRMAN, prior to the commencement of the proceedings, read a letter from the Rev. L. Blomefield, the following being an extract :—

Belmont, Bath ; March 15th, 1892.

Dear Mr. Chairman,—I much regret that my great age, with its attendant infirmities, renders it impossible for me to be present on the occasion for which the members of the Field Club meet together to-morrow. Otherwise, it would have given me great pleasure, as president of the club, to be the instrument of presenting to so old a friend, and for so long a time one of the most active members of the club, as Mr. Winwood, our secretary, the intended testimonial. . . .

As founder of the club in 1855, I remember its early as well as its late proceedings, and I think it was in 1867 that Mr. Winwood took the secretaryship, on the resignation of Dr. Steele, who had been the first to hold that office. I had known Mr. Winwood ever since he first came to settle in Bath—a few years previous. He appeared to me to take an interest in science even then; and with Charles Moore (also a member of the club), as an example always before him, he soon took to geology, at which he has worked ever since most energetically and successfully, as all the club know. But he has never neglected his duties as secretary, and it is for the long continued services he has rendered to the club in this capacity, that its members desire to offer him the projected testimonial in return for all he has done, and to show their gratitude for the same. . . . With best wishes for the success of the club in the hands of the new secretary,

Yours very truly,
L. Blomefield.

The Chairman said he did not think it possible for anyone but Mr. Blomefield to give expression to a full appreciation of Mr. Winwood's character as a scientific man, and it was a source of deep regret to him that he was unable to be present on that occasion. With regard to the duties connected with the office of secretary, however, he could personally testify that Mr. Winwood had performed them with the most earnest and business-like attention, and the members of the club were to be congratulated on having held him for so many years. In discharging his various secretarial duties, he had not only shown ability and persevering energy, but also great tact. In his opinion the example which Mr. Winwood had given them of perseverance and attention to the club, as well as strict devotion to its objects, had been a great means of continuing it successfully for so many years. It had been said that no club could exist longer than ten years in Bath, and, therefore, the fact that the Field Club had lasted 39 years, or nearly four times that period, was somewhat remarkable. Still, he trusted there was every probability that it would continue for a much longer period.

The Rev. W. W. Martin (the newly appointed secretary), then read a letter from the Rev. Canon Ellacombe, M.A., who was also unable to attend the meeting. An extract from the letter is appended :—

Bitton; March 9th.

Dear Martin,—There is no chance my being able to attend the meeting on the 16th, and I am very sorry for it. I should very much have liked to have been present when the club gave Winwood the well-earned token of their appreciation of his services. . . . There is probably no member of the club who can speak from experience so well of Winwood's services as I can, for I have been a member during the whole time of his secretaryship. I do not exaggerate when I say that he has been an ideal secretary. He has not only been unwearied in his work, but has carried it through in a way that has given great pleasure to others. . . . Speaking for myself, among the many pleasures of my life, my intercourse with the Bath Field Club has brought me many happy days, and for much of that I feel myself chiefly indebted to the secretary.

I remain, yours very truly,

Hugh Ellacombe.

In making the presentation, which consisted of a valuable petrological microscope, the Chairman, on behalf of the Members, expressed their indebtedness to the Rev. H. H. Winwood for his earnest exertions in supporting the Club for so many years, and expressed a hope that he might live long to see it flourish and continue its delightful discoveries in science, and its observations into the wonders of nature. The microscope bore the following inscription :—

Presented to the
Rev. H. H. Winwood, M.A., F.G.S.,
By the Members of the
Bath N. H. and A. Field Club,
On his resigning the post of Honorary Secretary,
Which he had filled with untiring zeal and ability
For nearly Thirty Years.
18th February, 1892.

The Rev. H. H. Winwood, in rising to acknowledge the gift, said the flattering words which had been spoken by the Chairman were almost too much for him. He could assure them he did not deserve all that had been said; at the same time he had done the best he could to keep up the social and scientific interest of the Club. He expressed deep regret that the health of the President prevented him from attending, and also at the absence of their Vice-President, for, he remarked, without their assistance he should have been unable to carry out the duties attending the office. With regard to the presentation, he confessed it was not altogether unexpected to him, although undeserved. At the last Quarterly Meeting he was aware of the kind intention of the Members to present him with a testimonial, and expressed his unwillingness to accept it. The only one he would require to receive was the thanks of the Club for his past services, and the attendance of the Members at the Excursions and the papers. Notwithstanding his expression of unwillingness to accept a testimonial, however, he felt that as he had laid down his office, his power had departed, and the usual despotism which he had exercised over them had departed with it. Therefore, on finding they would not listen to his request, he felt compelled to bow to their superior views, and it now remained for him to express his deep thankfulness to them for what they had done. The gift was one of the best they could possibly have selected for him, and had he made the selection himself he should have chosen the very instrument which they had provided. It was, therefore, a present which he was most gratified to accept. With regard to the date of his Secretaryship, he was appointed to the office in 1863, following Dr. Steele. The Club was founded in 1855, and he joined it in 1861. Speaking of his successor in the office, he remarked that the Rev. W. W. Martin seemed to have entered upon his duties with commendable zeal, and he felt quite certain that he would be capable of maintaining the scientific worth and character of the Club.

At the subsequent Quarterly Meeting on April 5th, the Rev. H. H. Winwood was unanimously elected a Vice-President of the Field Club, and in returning thanks for the honour conferred upon him he hoped that he would still be able to take part in the future management and Excursions of the Club for many years, although his other occupations had not left him time and leisure sufficient to carry on the laborious duties of Hon. Secretary.

EXCURSIONS.

As to the Excursions during this year, the four proposed at the Annual Meeting, viz., to Forde Abbey, Symonds Yat and Goodrich Castle, Sudeley Castle, and Longleat have taken place, and the three last were largely attended. Two bye-excursions to Glastonbury and Edington also were made, but notes of each follow in their order:—

Forde Abbey.—The first excursion of the year in connection with the Bath Field Club took place on Tuesday, May 3rd, when 14 members started from Bath, and were joined by a 15th at Yeovil. Time is not money, seemingly in Somerset, and so the G.W.R. train, leaving Bath at 10.18, managed to cover the distance to Yeovil (43½ miles) in 2½ hours. This made the party late for an appointment that had been made to view the interior of the parish church of St. John the Baptist, and as a consequence its members rested satisfied with an examination of the exterior. The church, which stands in a wide open space, and is constructed of Ham Hill stone, is known by the title of the "Lantern of the West." It is a handsome edifice, built in 1376, but an older crypt of Early English architecture, dating from 1226, remains under the chancel, groined and supported by a central pillar, now used as a vestry. The late Professor E. A. Freeman describes the church as "one grand and harmonious whole, as truly the work of real artistic genius as Cologne, or Winchester, or St. Ouen." After lunching at the Three Choughs Hotel, the party left for Chard Road Station, from which a walk of one and a quarter miles brought them to Forde Abbey, which by kind permission of Mr. Evans, was thrown open to the Field Club. The visitors were conducted through the innumerable rooms, and admired the tapestry and the skilful manner whereby Inigo Jones had converted a Gothic monastery into a palatial residence. Forde Abbey was built in 1148 for some Cistercian monks, but the only remnant of the original building now standing is the chapter house. In 1539 it was surrendered to King Henry VIII. by Bishop Chard, the last abbot, and its annual revenues then were reckoned, according to Dugdale, at £374 10s. 6d. The church of the Abbey has entirely gone. It measured 295ft. by 60ft., and was dedicated in 1239. The cloister, of which only the north walk remains, is 82ft. in length, and is now used as a conservatory. The kitchen is still used as such. The tower has three stories, with splendid oriels to the upper two. The refectory has four square headed perpendicular windows, with elegant tracery, and five similar are now blocked up by the later buildings of Inigo Jones. In 1539 it was given by Henry VIII. to Sir Richard Pollard, and since his time it has successively been held by the families of Poulett, Roswell, Prideaux, Gwynn, Miles and Evans, Mr. William Herbert Evans, F.R.G.S., M.A., D.L., J.P., being the present owner. After making a circuit of the exterior of the Abbey the excursionists returned viâ Templecombe, and reached Bath at 9.5 p.m., after a day's trip of 126 miles, and with pleasant reminiscences of the very instructive objects of antiquarian interest which they had been enabled to view.

Raglan and Goodrich Castles, Symonds Yat and Ross.—The second excursion of the season took place on May 31st and June 1st, and was attended by 13 members of the Field Club. The weather was most favourable, with an almost tropical temperature. The thunderstorms fortunately passed over the localities visited by the club previous to the arrival of the excursionists, so that the steep paths at Symonds Yat and streets at Ross were found cleared of all dust and soil. Leaving Bath by G.W.R. at 9.5 a.m., on May 31st, a saloon carriage was awaiting the 13 members at

Bristol, which the Railway Company generously placed at the disposal of the club, and the train arrived punctually, viâ the Severn Tunnel and Pontypool, at Raglan. After a beautiful walk of half-a-mile through fields resplendent with flowers, the Castle of Raglan was inspected, and, needless to say, admired for its magnificent dimensions and exquisite structure, Mr. Somerset chaperoning the party over the ruins, and explaining the uses of the various parts of the building before its destruction by the cannons of Sir Thomas Fairfax, in 1646, after the memorable siege of 11 weeks for which the octogenarian Marquis of Worcester held out for his King.

After an excellent luncheon at the Beaufort Arms a start was again made by train for Monmouth, whence three of the members of the party returned to Bath, but not before a vote of thanks had been unanimously accorded to one of them, whose influence with the Great Western Company had obtained for the club the comfortable saloon carriage. Ten members of the Field Club bid farewell to the deserters, and in a short time arrived at the much frequented and charming spot, Symonds Yat, which was duly climbed and the world-renowned view from the summit enjoyed, fortunately, in a perfect atmosphere, a heavy thunderstorm having but an hour previous burst over the Forest of Dean and cleared the air. The geology of the Yat was here explained to the excursionists by their Vice-President, and the botanical treasures of this limestone height subsequently were searched for with very successful results. One of the rarest of English wild flowers, a Heleborine styled "Cephalanthera grandiflora," was met with, besides four or five species of orchids, including fly, spider, and spotted. Descending to the level again the excellent temperance restaurant of Mr. Davis supplied the party with the necessary tea, and finally before 8 p.m., the train deposited the party at Ross, where the fine and comfortable Royal Hotel, with its unique view over the meandering Wye, offered an excellent dinner to the wearied excursionists and a refreshing rest for the night.

Starting again with renewed vigor, the ten members visited the lions of the town, and all reliques in the church and town of the local hero, John Kirle, " The man of Ross." The sucker of his tree in the church of St. Mary still shows vitality, and the Market House built in the time of Charles I. of soft old red sandstone, and now much weathered, still exhibits his rebus signifying, " I bear Charles on my heart." At 10.40 the train again carried the excursionists to Kerne Bridge, five good pedestrians preferring to cover the six miles on foot, but all met again at the great object of attraction, Goodrich Castle, about two-thirds of a mile from the station. The architecture of the Castle from the days of " Godricus dux," who gave his name to the place in the time of Cnut, to the reign of Henry VII., is of a most interesting character. The question whether the windows of the keep are Saxon or Norman will always remain a subject of debate, but no two opinions will exist about the picturesque beauty of the arches of the Ladies' Tower and the Chapel. The Castle in the time of the Commonwealth was held by the Countess of Kent, a Grey. The Greys, Earls of Kent, had inherited it from the Talbots, Earls of Shrewsbury, by the marriage of an heiress in 1616. After a long siege Sir Henry Lingen, who had garrisoned it for the King, surrendered it, in 1646, to Col. Birch. Next year the Countess of Kent received compensation for her Castle, which was ordered to be slighted by the Protector.

The church of Goodrich was afterwards visited by the members of the club, but the eucharistic chalice, presented to the parish by the grandfather of Dean Swift, who was rector during the Commonwealth, and ejected for his Royalist proclivities, could not be seen owing to the present rector's absence. Much indignation was, however, aroused among the antiquarians of the party by the discovery that an enormous boulder of about 12 tons weight in the churchyard, consisting of the conglomerate of the old red sandstone, to all outward appearance an " ice-borne erratic " had been converted into a sepulchral monument to some

Herberts. But subsequently at "The Hostelrie," which is the title of the village inn, a castellated building erected by Sir S. R. Meyrick in the same style as Goodrich Court, the secret was let out, that an heir, faithfully fulfilling a death-bed promise to his kind testator, not to erect any hewn monument over his body, engaged two traction engines to drag this rock from Symonds Yat, and after great expense and diminishing its bulk succeeded in getting this mass of conglomerate into the churchyard, at the top of the hill, to serve as a tombstone. Mr. Moffatt, the present owner of Goodrich Court, has erected a magnificent village club, reading and dancing rooms, and handed over the building for ever to a committee of 12 labouring men, on the terms that no political or religious differences be a bar to admission, and that newspapers of all sides be supplied in the reading room. The saloon carriage again received the excursion party at 2.55 p.m., and as the thunderstorms seemed threatening, and thus far all had escaped a severe wetting, prudence advised no stoppage at Tintern Abbey, unsatiated though the party's thirst was still for architectural and antiquarian investigation, and Bath was reached at 6.45 p.m. in an interval luckily between two thunderstorms.

Sudeley Castle.—On Tuesday, June 28th, the third excursion of the year took place, and a large muster of 32 members of the Field Club started by the Midland Railway, at 10 a.m. for Cheltenham, whence a couple of breaks conveyed them eight miles to Winchcomb. On arriving at Sudeley Castle, half a mile from the town, the lady of the Castle, Mrs. Dent, and a considerable number of her guests, received the party in the grand quadrangle, the Rev. Canon Ellacombe, a vice-president of the Field Club, being among the visitors staying at the Castle, and introducing the new arrivals. At the invitation of the hospitable hostess the whole party forthwith ascended to an extensive upper chamber, and partook of a sumptuous luncheon. Around the walls of this long room were arranged several antiquities, such as man-traps, the fossil tibia of an elephant from Egypt, iron swords and pikes, &c.

Having done full justice to the hostess' excellent repast, the Rev. Canon Ellacombe gave the company a brief résumé of the history of Sudeley Castle, and stated that of the building originally constructed in the reign of King Stephen only a very small remnant existed in the base of one of the towers. Considerable parts of the second structure by Sir Ralph le Boteler, Baron of Sudeley, Lord Treasurer and High Admiral to Henry VI., still remain. Originally it consisted of two spacious quadrangles, lying N. and S., with embattled towers on the W. side, and a banqueting hall and octagon tower on the E., on which side externally were also a chapel and pleasaunce. In 1469, on the success of the Yorkists, Lord Sudeley being a Lancastrian was compelled to surrender his castle to the King, Edward IV., who granted it to his brother the Duke of Gloucester, later on in 1483 King Richard III. On the succession of the Tudors Henry VII. granted the Castle to his uncle Jasper, Duke of Bedford, but it again fell to the Crown, and in 1547 Edward VI. presented it to Sir Thomas Seymour, who had wed, as fourth husband, the widowed Queen, Catherine Parr, and created him Lord Seymour, of Sudeley. The Queen died after giving birth to a daughter two years after marriage, and is buried in the chapel, where the late owner of the Castle, Mr. J. C. Dent, has caused to be erected an extremely beautiful monument in alabaster and marble. This Lord Seymour afterwards was attainted and lost his head, and his Castle was granted to William Parr, Marquis of Northampton, who soon forfeited it, and Queen Mary presented it to one of her strenuous supporters, Sir John Bridges, Kt., of Coberley, whom in 1554 she made Lord Chandos of Sudeley, Queen Elizabeth paid several visits to the third Lord Chandos of this Castle, and King Charles I. was the guest of George, the sixth lord, in 1643. The following year Sir William Waller took it after several assaults, and in 1649 it was dismantled and became a quarry for the whole neighbourhood. In 1837, on the purchase of the property by Messrs. J. and W. Dent, the Castle again rose from its ruins, and is now one of the most palatial residences of the kingdom.

The historical lecture of Canon Ellacombe being ended the whole party was divided into sections of six or seven under separate guides, and conducted through innumerable chambers, all stocked with an infinity of articles of historical interest, more particularly with some connection to the history of the castle. With marvellous lucidity the young ladies and gentlemen, who acted as conductors, explained the reliques of Queen Catherine Parr, the furniture used by the several sovereigns who had visited the castle, the marks and arms, seals and tokens of the several noble owners of the place, and the black-jacks, spurs, pikes of Cromwell and his Roundheads, who had levelled it. Numerous reliques of the monasteries of Winchcomb and Hayles, and coins, tesseræ, &c., of the Roman period, two extraordinary pictures by Hogarth, styled "The Bridge of Life" and "The March of Intemperance," carved oak bedsteads, antique silver plate, coloured glass and a collection of articles too numerous to mention or remember after a perambulation of less than two hours, render this Castle a veritable museum. The privilege granted by Mrs. Dent to the Bath Field Club to examine all these treasures will ever remain an agreeable reminiscence, and such a day spent among archæological treasures, when accompanied also by the personal kindness and hospitality of the hostess not only expands the knowledge of history and architecture, but creates feelings of thankfulness that our lot is placed in a country where owners of historical castles and valuable collections of antiquities open them freely to their neighbours less blessed than themselves. Having partaken of a farewell cup of tea with the kindly hostess and bid her many thanks, the members of the Field Club returned to Cheltenham, but not without experiencing a heavy shower on the road, and thence were safe back in Bath before half-past 8 p.m., after a day which will be remembered as a red letter day in the club's annals.

Glastonbury.—On Tuesday, Sept. 13th, a goodly muster of 25 members of the Field Club started at 9.5 a.m. from the Midland Station for Glastonbury, with a view principally to examine the lately discovered British village now being excavated by Alderman Bulleid and his sons. Arriving at Glastonbury at 10.50, the club was met by Mr. Arthur Bulleid and taken first to the Antiquarian Museum, where all articles discovered in the pre-historic settlement are deposited. These consist of much coarse hand-made pottery in fragments, annular objects of baked clay, shuttles, scrapers, a jet ring and domestic implements of bone and sandstone, but not one weapon of offence or defence. The bones also, which are extremely numerous, are principally of farm-yard animals, horses, pigs, sheep, and deer. The entire absence of human bones seem to betoken these ancient inhabitants of the peat fens to have cremated their dead, and maybe, some cinerary urns will some day be discovered on the distant elevated country, bordering the bog level. These aborigines were no cannibals, and no implements of metal, flint or wood betokening a warlike nature have yet been discovered. They evidently were given to pastoral pursuits and hunted the roebuck and deer, and existed on fish and cereal crops. The Messrs. Bulleid have lately discovered a canoe of oak, 18ft. in length, and hollowed out of a single trunk, in a marvellous state of preservation, after being buried under peat for more than 2,000 years. This canoe is now in an outbuilding in Mr. Bulleid's private grounds, and was shown to the members of the Field Club, but it is doubtful whether it will bear its exposure to the atmosphere, after it becomes thoroughly dry, or will crumble into dust. The entire absence of coins or Samian pottery in the excavations betokens that these ancient people existed before the Roman age, and afford an interesting opening for Archæological research to dissipate the gloom which hangs at present over the whole history of these peaceful aborigines; we hope future discoveries of skulls, weapons and personal ornaments will reward the labours of the Messrs. Bulleid.

The site of the excavations is situated about 1½ mile to the north of Glastonbury, in the very centre of a peat bog, and close to a rhine. In a field slightly raised above the surrounding country are seen some 50 or more round mounds which originally excited the curiosity of Mr. Arthur Bulleid, and led to the subsequent discovery of the village. Only a few have been opened, but the discoveries made in these few have well rewarded the labour and expense. The huts of this people were extremely peculiar. On the very surface of a quaking peat-bog a thick layer of brushwood was laid, kept in circular form by long alder poles driven into the peat.

These alder poles still look fresh and sound, although very soft when handled, and are sharply cut to a point by some stone axe, a specimen of which has not yet been found. Over the brushwood there was laid a foundation of larger timber, tied by piles driven through the substratum into the peat. On this was laid a mound of clay a foot thick, rising to the centre on which was some baked clay to support the hearthstone. The hut roof was of wattled osiers, covered with clay, many pieces of which lie about the excavations, retaining the shape of the wood and even the builders' fingers. As was natural with such a precarious foundation, the whole hut gradually sank into the peat, and to restore the original level these inhabitants repeated the former foundations, and in one excavated mound no less than three hearthstones are seen superimposed on each other. The clay for these floors can only have been brought from the distant lias beds of Polsham, Meare, or Glastonbury. Quantities of split bones lie about the excavations; beans, peas and decayed timber, some of the latter exhibiting a most brilliant blue mildew on the surface. The excavations are to be continued as subscriptions from the various learned Antiquarian societies of the country enable the works to be carried on. The situation being in a water-soaked peat-bog the only season available for exploration is the dry summer and autumn.

The Messrs. Bulleid having given the Field Club and numerous other visitors all the information in their power, for which they received the hearty thanks of the assembled company, a general return was made to Glastonbury, where Mr. Arthur Bulleid honoured the Field Club with his company at lunch in the old Pilgrim's Hostelrie, built 1475 by Abbot Selwood, now "the George Hotel," of which the façade was greatly admired, as well as that of the Tribunal, built by Abbot Beere as a court-house, 1495. A few of the members of the Field Club, to whom the remains of the Abbey were well known set off for a walk to St. Michael's Tower on the Tor, where the last Lord Abbot Whitinge, Nov. 15th, 1539, for no particular crime except concealing the Abbey treasures from Henry VIII.'s rapacious myrmidons, was hung, drawn and quartered, Bath being dishonoured by the gift of one of his quarters, as a warning not to follow that excellent man's example in opposing the king's prerogative. The greater number entered the ruins of the Abbey, viewed the exquisite architecture of the transitional chapel of St. Mary, erroneously styled St. Joseph's chapel, by an ineradicable belief of the public in the truth of an old legend that St. Joseph of Arimathea built the first wattled chapel on this site, and was buried therein in a bifurcated shirt. The monks naturally fostered this craze, as it brought great wealth to the monastery, as did also the supposed possession of the body of St. Dunstan, whose bones certainly were at Canterbury, but the supposititious body wrought innumerable miracles, and true or false was a regular goldmine to the Abbey. Having thoroughly examined the ruins, and proceeded to the Abbot's kitchen, a start was made for the station, where the saloon carriage placed by the Somerset and Dorset Railway Company at the service of the Field Club, was attached to the 4 p.m. train, and brought the members back to Bath at 6.15 after a most interesting excursion.

Frome and Longleat.—On Friday, October 7th, the excursion to Longleat, originally fixed for September 13th, but deferred owing to the serious illness of the noble owner, the Marquis of Bath, took place, and 33 members of the Field Club started from the Great Western Station at 10.18 a.m. Arriving at Frome, the noble church of St. John Baptist first received a visit, and the newly-erected rood screen, with life size figures of the crucified Lord and His Blessed Mother and the Evangelist St. John was much criticised, its colouring being gorgeous and little in harmony with the sombre hues of the building. The chapel of St. Nicholas is now converted into a baptistry, and on the floor around the font are inlaid Scriptural representations of the seven deadly sins, and the opposite Christian graces. The Lady Chapel, forming a sort of north transept to the nave, has beautiful painted windows relating the life of B.V.M., and has now an altar of its own, as has also the south aisle of the chancel. The reredos in Carrara marble and alabaster, the pulpit with figures of the eight great preachers of Christendom, and numerous statues of saints inside and outside the church, as well as the stations of the Cross, to the left of the ascent to the north porch were sculptured by Forsyth with great boldness and effect. A mural tablet to the two young daughters of the Earl of Cork in the Lady Chapel is by Westmacott. The fabric itself in its restoration shows very little of its original Norman character, except the arch entering the church from the south porch and two engraved stones built into the north-east corner of the south aisle. The nave is of eight bays, the four easternmost being of earlier date than the western, the columns of which latter are constructed upon the peculiar foundation of blocks as high as the pews. Outside the eastern end of the church is the unique iron tomb of the saintly Bishop Ken, a nonjuror, who died in 1711.

Leaving this fine church, many of the party threaded the narrow and tortuous lanes of the town to the factory of Messrs. Rawlings, on the South Parade, and were courteously received by the foreman of the works, and shown the ingenious and peculiar machines for the fabrication of modern carding apparatus on leather, felt, and other material, which has superseded the old teasel in carding wool, cotton, and flax for the cloth factories. The one o'clock hooter hastened the departure of the visitors and workmen, and the Crown Inn was quickly found, where a substantial and liberal luncheon was provided for the party. After doing full justice thereto, two breaks conveyed 31 of the same four and a half miles to Longleat, passing through the magnificent park surrounding the house, where deer and pheasants abounded, and by their tameness and heedlessness of the presence of men and horses, seemed more like domestic cattle and fowl than feræ naturæ, destined to fall to the sportsman's shot.

The park extends over 4,000 acres, and in the centre stands the mansion, one of the largest in England, erected in 1565, after designs of John of Padua, Surveyor of Works to Henry VIII., and subsequently altered internally by Sir Christopher Wren and Sir Jeffrey Wyatville, the gardens being laid out by "Capability" Brown for the 3rd Viscount Weymouth, created Marquis of Bath in 1789. The length of the chief front is 220ft., the side fronts 180ft., pierced with innumerable windows, the roof crowned with turrets and large statues. The Marquis of Bath personally received the Field Club in the Grand Hall, adorned by heraldic shields, representing all the matrimonial alliances of the family of Thynne, and hunting pictures by Wootton, and after traversing many fine rooms which were ornamented with buhl cabinets, tapestry, portraits of historical characters, valuable Caxtons and pictures by Snyders, Holbein, Lely and VanDyke, those of the party who were students of Renascence architecture and anxious to certify themselves whether the octagonal chimneys were built contemporaneously with the rest of the building, were allowed to mount to the leads and circumambulate the roof. After bidding farewell to the noble owner, and thanking him for his courteous reception, a retreat was made to the Frome Station, but not before the best pedestrians of the party had scaled Heaven's Gate in the park, and admired the glorious panorama thence observable. The return journey to Bath was safely effected, and the members of the Bath Field Club dispersed to their several homes.

Westbury and Edington.—Nestling under the northern escarpment of Salisbury plain lies a little village of 927 inhabitants, named Edington, containing the only remaining Monastic Church in Wiltshire. Here, in a profusely wooded country, four miles from the nearest town, Westbury, a native of the place, Bishop Edington, the predecessor of William of Wykeham in the see of Winchester, built between 1352 and 1361 a church of almost cathedral proportions, and at the request of Edward the Black Prince attached to it a monastery of Bons-hommes of the Augustinian Order, monks who only held one other Priory in England, at Ashridge, Bucks. The endowment of the living is exceedingly small, as in most other secularised monastic churches, the great and little tithes having been presented by the King at the Reformation to lay favourities. In this case according to Crockford £1,396 of the tithe rent charge is impropriated, leaving £30 to the vicar. Since the commencement of the century this living was held by a Dr. Littlewood for more than 50 years, the grass and weeds covered the floor of the nave, and service was held in the chancel, the whole fabric being in a terribly dilapidated condition. On this excellent old vicar's decease in 1880, the Rev. H. Cave-Brown-Cave succeeded, and by his own liberality and the aid of his many friends, succeeded in collecting sufficient funds to restore this spacious and interesting church into something like its original condition. The Bath Field Club, whose previous visit to the locality was in 1873, when the church stood in ruin, paid a second visit on October 25th, and 12 members braved the piercing wind and drizzle during the five miles drive from Westbury Station and back. Six other members who had put down their names for the excursion, could not muster up courage to face the ordeal, and if they saved themselves from bronchitis, lost a most instructive architectural lesson, and a subsequent luncheon at the Lopes Arms Hotel at Westbury, well repaying the discomfort of the drive.

The church now stands in excellent repair, under the care, as vicar, of the Rev. George E. Long, his predecessor having departed this life prematurely in 1891, from a chill caught while personally attending to the restoration of his church. A handsome cross, mounted on three steps in the churchyard, has been erected to his memory, and as a thankoffering for the restoration of the building, effected through his liberality and the aid of his friends. The building itself is of the most interesting character—cruciform with a central tower, with the Pavely cross flory in the tracery of the belfry windows, and a south porch groined with a parvise above. The style of architecture is Decorated, gradually passing, as the building was being built, westward into Perpendicular, which is conspicuous in the great west window. The nave now, as restored, is a church of itself with altar. pulpit, and handsome brass eagle, given in memory of Dr. Littlewood, it is of six bays and 75 feet in length, with aisles. A small chantry chapel is in one bay, being the tomb of the Pavely-Cheney family, bearing the quartered arms of that family, but bereft of its inlaid brasses. The roof has oak for its main arches, and groining, but the interstices are filled with plaister ceiling, picked out rather incongruously with a sort of light chocolate Gothic tracery.

The transepts and central tower contain many matters of interest, especially the ancient coloured glass in the east window of the north transept, the coloured monument of an anonymous monk, in the south, supposed to be John Bayntun from the many repetitions of his rebus on the tomb, a baytree growing in a tun; his feet rest on a tun which contains the same rebus with the letter J. thereon. The old oak of the rood screen has been restored to its original place, and the eastern half restored by excellent imitation in modern oak, but strange to say there seem to be no stairs to mount to the summit. This rood screen stands under the eastern arch of the central tower, and within there is a second church, with altar and old oak reredos. Between the windows, under canopies, remain two headless statues, and on each side of the eastern end of this chancel there is a magnificent monument. On the south an alabaster tomb of beautiful workmanship, dating from 1630 under a canopy, with two life-sized figures of Sir Edward Lewys, gentleman of the Privy Chamber to Charles I. and of his wife Lady Anne, daughter of the Earl of Dorset, with kneeling figures of their five children below. On the north a monument by Sir F. Chantrey to Sir Simon Taylor, Bart., who died aged 32 and is represented in marble with his wife and daughter bending over his lifeless body in deepest grief.

The Field Club tore itself away reluctantly from this fair edifice, and after viewing the ancient yew tree in the churchyard, 21 feet in girth and supposed to be about 2,000 years old, returned to the warmer and well stocked upper chamber in the old Lopes Arms Hotel at Westbury, whence, after restoring their creature needs, they sallied forth to view the restored church of All Saints, once said to have been a Norman structure, but now so perpendicularised as to leave no trace of its former self. It is, however, a fine large cruciform church, with narrow aisles, transepts, central tower and chapels to the eastward of both transepts, and a groined porch to the south. There are many modern painted windows, of various degrees of excellency, some being, perhaps, the worst examples of glass in England, and two in the nave, to the memory of a former vicar, Duke, and the widow of another, named Butt, being exquisite. In the south transept there is a fine monument to Sir J. Ley, Earl of Marlborough, Lord President in Charles I. Council, 1629. The inscription is illegible, and parts of the effigy and its surroundings seem to have been painted green in former days. On an ancient lectern in front of this monument is a chained volume of Erasmus' commentaries on the Gospels in black letters. Unlike most churches, this one is kept comfortably warm, and the Mauduit Chapel to the south of the chancel has a second altar, and is evidently used for the week-day services.

Leaving this church a visit was paid to the magnificent public baths, a present to the town of Westbury in the Jubilee year of Her Majesty the Queen from the late member for the borough, Mr. Laverton. The swimming bath is large and well fitted with dressing cabinets, seats and a gallery for spectators. The water, evidently derived from the neighbouring chalkdown, is of an exquisite azure hue, and is kept at 72 deg. F. Having seen all that deserves being seen in Westbury the Field Club returned to the saloon carriage kindly placed at their disposal by the G.W.R. Company, and found themselves safely back in Bath after a bitterly cold day, but very instructive excursion.

The Excursions of the year having thus been duly concluded, the members of the Field Club had the great pleasure of hearing that their venerable founder and President, the Rev. Leonard Blomefield, M.A., F.G.S., F.L.S., had received from the Linnean Society a congratulatory address on his attaining the 70th anniversary of his election as a member, and a unanimous wish was expressed by the members of the Field Club to have the said address and their respected President's reply to the same recorded in their Proceedings. The consent of the Rev. L. Blomefield having been graciously accorded, the address and reply here follow :—

TO
The Rev. LEONARD BLOMEFIELD,
of
Belmont, Bath, M.A., F.L.S.

We, the undersigned Fellows of the Linnean Society of London, on the 17th day of November, 1892, in General Meeting assembled, desire to congratulate you as "The Father of the Society" on the occasion of your attaining the Seventieth Anniversary of your Election, an event unprecedented in the annals of this or perhaps of any other Society. We desire to record our gratification on learning that at the advanced age of ninety-two years you still retain a vivid interest in that branch of science of which during an exceptionally long career both by precepts and example you have been so able an exponent, and we cordially express the hope that so worthy a life may be long spared.

C. Stewart, President
B. Daydon Jackson, Secretary
W. Percy Sladen, Secretary
John W. S. Meiklejohn
George J. Fookes
H. Goss
J. E. Harting
E. M. Holmes
Baxton Shillitoe
William H. Blaber
F. H. Perry Coste
A. R. Hammond
Albert Günther
A. B. Rendle
John Gilbert Baker
W. H. Flower
William Carruthers, Vice-Pres.
Herbert Druce
Edward A. Batters
Alfred W. Bennett
James Murie
G. S. Boulger
George Murray
Francis J. Clark
Henry Groves
A. W. Kappel
A. G. Butler
Edmund G. Baker
Antony Gepp
Charles A. Wright
St. George Mivart
Charles B. Clarke
G. B. Howes
George Henslow
Charles J. Breese
W. F. Kirby
Thomas Hanbury
Thomas Christy
Arthur Smith Woodward
James Groves
James Bissett
J. Bennett Carruthers
James Britten
F. Edward Hulme

Supplementary Address to the

Rev. Leonard Blomefield, M.A., F.L.S.

We, the undersigned Fellows of the Linnean Society unable to be present at the General Meeting which was held on the 17th November instant, when it was resolved to present you with the

Address which has since been forwarded to you, desire to add our cordial congratulations to those already conveyed.

Jos. D. Hooker
Henry Seebohm
Travers J. Briant
Frederic N. Williams
J. T. Tristram-valentine
Daniel Oliver
Arthur Lister
George Brook
D. H. Scott
D. Morris
W. Saville Kent
Frank Crisp
Clement Reid
Maxwell T. Masters
Ew. Nilson
Thos. Frederic Inman
Linley Blathwayt

[*Rev. Leonard Blomefield to Mr. J. E. Harting, Librarian of the Linnean Society.*]

Belmont, Bath;
Nov. 22nd, 1892.

My Dear Mr. Harting,

Thank you very much for your letter received on Saturday, and yet more for the very valuable congratulatory address from the members of the Linnean Society generally, which came safe to hand yesterday evening. In respect of this last I hardly know in what terms to make any adequate reply, or therein to express what I feel in the way of gratitude and thankfulness for so high a mark of esteem on the part of the Society, with which I have had so little intercourse for a long time back. True it is that my connexion with the Society, as far as membership goes, has now lasted for the long term of seventy years, longer perhaps than in the case of any other member, but it grieves me to think how little I have done personally for the interests of the Society, how trifling the contributions I have formerly made to its publications. When I open and inspect the journals which it puts forth from time to time (still so liberally sent to me as they appear), and see the valuable work being done by others, often most elaborate researches into the minute structure of the lower forms of animal and vegetable life, my own doings in Zoology and Botany, fond as I am of the subject even now in extreme old age, seems as nothing. Yet the retrospect is not without other reminiscences of a more pleasurable character. It brings back to my recollection departed friends, whose names may be found in the older lists of the Society, with some of whom I joined in the pursuits that gave us so much pleasure, but who have long since been called to their rest. I as yet remain; if I cannot claim acquaintance with many of the Fellows of the present day, I shall always hold in grateful remembrance those who were instrumental in getting up the congratulatory address just received, which shall always have a place on the walls of my study, whereon there are several portraits of old Linnean Society Members, including that of Mr. Macleay (father of Alexander Macleay), who was, if I remember right, Secretary to the Society on the evening on which I was admitted; Mr. Lambert, V.P., being in the chair.

Once more expressing my gratitude for the great honour that has been done to me.

Believe me,
Dear Mr. Harting,
Sincerely yours,
LEONARD BLOMEFIELD.

The papers read before the Field Club during the year are published in this number. The first was read on March 16th, 1892, by Mr. W. H. Tagart, who had lately returned from Siberia and exhibited a large collection of clothing, and household articles from Lake Bajkal, with photographs of the natives and country about the great rivers of Russian Asia, and the towns of Yeniseisk and Irkutsk. It was a translation from a very interesting account published by a Swedish traveller, and a short synopsis of the paper is printed as Appendix I to this Summary.

On February 1st, 1893, a paper was read before the Club by the Rev. H. H. Winwood, vice-president, on certain deep well borings in Somerset, and Col. J. T. Chandler presented an ancient deed lent to him by Major C. H. Simpson, which records the terms by which the British Crown acquired the regal rights of the Dukes of Atholl over the Isle of Man. The first paper is printed at page 335, the second as Appendix II to this Summary.

The Club starts on a new year with a roll of members numbering well nigh the maximum of 100 whereat the bye-laws limit the number of members. The past year's obituary of members has been very small. Only two have departed to the Great Majority, the Rev. Hayes Robinson and Major J. Wedgwood Yeeles, the former a member of the Field Club since 1883, the latter since 1866. Amongst the large number of gentlemen, now on the Club's register it is to be hoped many will during this year make their researches in their various sciences and favourite pursuits with such success that more papers may be forthcoming at the close of the excursion season on interesting discoveries, and the particular objects of the Club's formation, the Natural History, Geology, Botany, and Antiquities of the neighbourhood.

WALTER W. MARTIN,
Hon. Sec.

APPENDIX I.

An Expedition to the Angara River in Siberia, by Robert Runeberg, son of the Great Finnish Poet, Johan Ludwig Runeberg, translated from the Swedish.

(Read, March 16*th,* 1892.*)*

On the 24th June, 1883, Runeberg left St. Petersburg commissioned by Mr. A. Siberiakov, to visit the Angara River and investigate its navigability.

The journey to Nisjnij Novgorod was made by railway, and thence by steamer along the Volga and Kama to the town of Perm. He gives a description of the boat accommodation and food which was not luxurious, but fairly comfortable (bedclothes had to be taken). There is plenty of communication on this route, Russia's principal commercial highway. The transport of goods is carried on almost entirely in barges towed by strong tugboats, which are paddle steamers of from 100 to 180 horse-power, drawing 3½ to 4 feet. On the Volga's tributaries are over 500 steamers, mostly built in the country, and nearly all used as tugs. The principal traffic is in spring, in summer the water falls so much that one year vessels drawing over 3 feet could not float, and the loss to Russia was enormous, as the goods for Nisjnij fair could not be forwarded.

The frequent movement of the sandbanks on the Volga is a great hindrance, and the pilotage so difficult that vessels have to signal to each other to show on which side they are to pass. Wood is used principally for fuel, but higher up naphtha.

They passed Kosmodemjausk, important by its great timber fair, and after passing Kasan the Volga joins the Kama, a large river whose waters are even more muddy than the Volga, and keep distinct for a considerable distance. In 4 days and nights they arrived at Perm, and travelled thence by rail to Ekaterinburg, distant 468 versts,* which took 20 hours and 45 minutes on account of the long stoppages.

†At Ekaterinburg they bought Tarantasses or 4-wheeled carriages for the land journey across Siberia, of which he gives a description:—Two pair of wheels are placed at about 10 feet apart, and their axles are joined by several shaking birch poles of 2 inches

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*A verst is roughly about two-thirds of an English mile, exactly 1,166 yards 2 feet.

† There has been now for some years a railway from Ekaterinburg to Tjumen.

diameter, these serve as springs, and upon them rests the body of the carriage, which is about 6 feet long; over the back part is a hood of leather that can be lifted up or dropped down, and in front the apron may be buttoned to the roof, so forming an enclosed chamber. The vehicle, although curious to look at, is very suitable to the climate. They started at midnight hoping to catch the mail steamer from Tjumen to Tomsk, but being disappointed preferred to continue the journey of 3,367 versts to Irkutsk by road, to waiting 4 days for the next steamer. The travelling was very rough, the roads very bad, sleep almost impossible, and they went on day and night. They passed through small towns such as Jalutorovsk, Isjim, Tjukalinsk, Kainsk, &c. He gives a description of a Siberian peasant's dwelling, with wooden chairs, gaudily painted chests, and coarsely coloured prints on the walls, members generally of the Imperial family of Russia or battle scenes, one room always with carpets on the floor. Frequently flowers in the windows, more so as you go farther East. Abundant pastures, immense herds of horses, sheep and cows, and in farmyards geese, fowls, dogs, &c. Milk and eggs always to be had, other food had to be taken with them. They passed many escaped convicts, who wander along begging, but are generally well behaved, as otherwise they are treated like wild beasts, and especially cruelly by the Buriats. They are called "Brodiagi," and generally go two together. In Winter they give themselves up again, and go back to the nearest prison. Their careless camping out at night is a frequent cause of forest fires.

The gnats, larger than European ones, light yellow in colour, and with a more virulent sting were a great source of annoyance. A horse left loose on the plains will in a short time be stung to death by them. They frequently passed long caravans of emigrants from the internal Government of Russia, going principally to the Tomsk or Amur districts.

The stations are from 20 to 30 versts apart, but once they travelled 45 versts (about 30 miles) in 3 hours with the same horses.*

On the 27th June, they crossed the Ob in a paddle wheel ferry worked by horses on board going round a capstan.

They arrived at Tomsk on the Tom, a tributary of the Ob, where were elegant houses and a stately building, the new University. There still remained 1,560 versts to Irkutsk. The roads and horses became worse and the posting dearer, but the landscape smiling and luxuriant. Many large cottages surrounded by cultivated fields. On the other side of Krasnoyarsk the country was still more fertile.

On the 18th July, they arrived at Irkutsk, having in 16¾ days and nights travelled 3,367 versts, and from St. Petersburg in 24 days and nights.

The inhabitants about Irkutsk and the Bajkal Sea are mostly Buriats, who should be Christians, but still preserve many Heathen customs

He describes a ceremony on board a vessel of pouring spirits into a long glass, a few drops of which are thrown into the water, some on the rigging and boat, but the majority that remains down their throats, accompanied by long prayers. They make an intoxicating drink from cow and mare's milk called "Tarasum," corresponding with the Tartar "Aira" and the Yakut "Arigut." This, although illegal, is generally practised, They also make "Kumiss" from mare's milk, which is intoxicating if taken in large quantities.

After staying 10 days in Irkutsk, they started on the 29th July in a lighter or barge equipped for the journey down the Angara, of which vessel he gives a long description. The weather was fine and the river most beautiful.

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* I travelled once 35¾ versts (about 24 miles) in 2 hours and 20 minutes, and another time 28½ versts (about 19 miles) in 1¾ hours, with the same horses.—W. H. T.

Here he describes the various routes to Siberia.

1. By steamers from Odessa through Suez Canal to Vladivostok.
2. Through the Arctic Ocean by the Kara Sea and up the Yenesei.
3. Through Orenburg, Orsk alongside the Ural River, and then through Omsk.
4. By Perm and Ekaterinburg, and as described above.

He gives a description of the various modes of *travelling by government post and by free posting.

In spring and summer the traffic is principally by water, the mail steamer often having in tow a barge full of convicts, but in winter in long caravans of sometimes over 100 sledges, with one driver to about every 10.

He shows how by making a few canals it would be possible to have water communication all the way from Tjumen to Irkutsk, and thence by the Angara and Selenga, and if a short railway was made to the Amur right on to the Pacific Ocean.

There are numerous rapids on the Angara, the most important called "Podun."

The enormous size of the Siberian rivers may be imagined when you think that the largest rivers of Europe, the Rhine, Rhone, Danube and Volga would have to join themselves together to make a Yenesei, Ob or Lena. The length of the Selenga, Angara, Yenesei, is over 5,000 versts, and Reclus reckons that the whole of the Yenesei's water system is about 2,900,000 square versts.

The Angara is one of the most beautiful rivers in the world. Between Irkutsk and Bratskoj Ostrog (a Buriat fortress) there is already steamer communication.

He describes the scenery wide, stretching, tilled fields and charming groves. During the first day's journey they passed Distilleries, Tanneries, Saltworks, Cloth Factories, Glass Factories, &c., and the banks were well populated. Numerous islands were

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* Alterations have since been made in the posting arrangements.

passed, some 10 versts in length, and the wild beauty of these and the surrounding banks was frequently enchanting. The inhabitants of the banks are partly Russians and partly Buriats, the latter offering sacrifices of deer skins on long poles, and to the Gods, hoping thereby to have their flocks and herds doubled. Fish in the upper part of the Angara were rare. They fish with a rope sunk by weights to the bottom, along which are short fishing lines and thick iron hooks; on these moving in the water the sturgeon or sterlet strikes and the hook fastens in the skin. This tackle is called "samolor" or self-fishers. Besides this there is net fishing.

In 4½ days they arrived at Bratskoj Ostrog, about 20 versts from which are the largest Iron works in East Siberia, belonging to Herr Butin, at present under administration. They visited the works, and he gives a long description of the great obstacle of the development of Siberia's natural resources, and the existence of any industry being the difficulty of obtaining capable workmen, and the disastrous history of these works notwithstanding the excellent iron ore, coal almost on the surface, and immense virgin forests all within a short distance, the absence of competition and the splendid gross profits, but all in vain without intelligent labour.

Some versts below they came to the first rapids called "Pochmelnyj," which they passed next day with some difficulty. The crew became frightened and struck, but at last they got a sufficient number of men for the work. Then they passed the "Piannyj" rapids. The weather became worse, and they had more trouble with the crew. They were obliged at last to hire people from the nearest villages.

The next rapid was "Podun," the worst hindrance to navigation on the Angara, before passing which they took a pilot and more people on board. They fortunately passed, however, without striking the ground. Just at the rapids the river narrows down to about a kilomètre, falling 5 mètres in a 1,000, with a velocity of 4·7 mètres in the second.

An exploration was made as to the construction of a canal, which could easily be built 2 kilomètres long.

They afterwards passed the Pochmelnyj, Dolgij and Sjamanskij rapids, and on the 23rd August, the last on the Angara, the Strelkovskij, and after various adventures arrived eventually at Yeneseisk

The conclusion arrived at as to the navigability of the Angara was that a specially constructed steamer drawing 2′4″ of water should be able to travel from Yeneseisk all the way to Irkutsk, and ascend all the rapids including even the Podun.

The Angara, unlike other Siberian rivers, is almost entirely free from shifting sandbanks,

The party travelled again in a tarantass from Yeneseisk to Tomsk, and thence by steamer to within 130 versts of Tjumen, being prevented by the lowness of the water from proceeding further and had a further journey of 437 versts in Tarantass to Ekaterinburg.

On September 9th they passed the border line between Europe and Asia. and arrived in Petersburg on September 16th, after having in less than 3 months travelled about 14,000 versts, of which nearly 4,600 had been in a Tarantass.

APPENDIX II.

Deed of Revestment of the Isle of Man in the Crown of Great Britain. Exhibited by MAJOR C. H. SIMPSON; *with some Introductory Remarks communicated by* COLONEL CHANDLER.

(Read February 1st, 1893.*)*

It may not be inappropriate to give a short account of the manner in which the Stanleys became possessed of the Island, and of its history until its resumption by the Crown.

The first connexion between the Isle of Man and the House of

Stanley (from whom the Athole Family derived their title) was through Sir John de Stanley, to whom on the attainder of Henry Percy, Earl of Northumberland, the Island was granted by Henry IV. The first patent was for life, but was afterwards cancelled and replaced by another making the grant in perpetuity. English chivalry which had been conspicuous in the reign of Edward III. had degenerated in that of the unwarlike Richard II., and Sir John Stanley, who had travelled much, was almost the only English chevalier of his time. On his return to England he was followed by a French combatant, who defied the whole English nation. Sir John accepted the challenge and killed him, and thus won the favour of the heiress of Lathom and Knowsley, whose knight he had declared himself, and whom he subsequently married. Sir John Stanley and his successors held Man and the Isles pertaining thereto by homage and on payment to the King of a cast of Falcons at his Coronation. It may be mentioned that Percy's tenure was on condition that he or his deputy should bear at the coronation "Illum gladium nudum quo cincti eramus quando in partibus de Holderness applicuimus vocatum 'Lancastre Sworde.'" and it was to be borne "ad sinistrum humerum, sive sinistros humeros Regis." The patronage of the Bishopric of Man, founded by St. Patrick, A.D. 447, and the most ancient in the British Isles, was vested in the King of Man. The See of Sodor (Sudoer or Southern Islands) was instituted by Pope Gregory IV. 400 years later. Sir John Stanley, son of the first Sir John, King and Lord of Man, by advice of the Deemsters, convened the people at a Tynwald, where, standing on the Tynwald Mount, a barrow formed of earth taken from each of the twenty-four parishes in the Island, attended by officials and the Taxiaxi (House of Keys), he promulgated the laws which from the birth of time had been locked up in the breasts of their magistrates (called breast-law). This ceremony is continued to the present day, a remarkable survival from the most ancient times. "It is indeed remarkable" —to quote Professor Worsaae, of Copenhagen—"that the last remains of the old Scandinavian Thing which, for the protection of public liberty was held in the open air, in the presence of the assembled people, and conducted by the people's chiefs and representatives, are to be met with, not in the North itself, but in a little island far towards the West, and in the midst of the British Kingdom."

Thomas, Lord Stanley, fourth King of Man, whose second wife was mother of Henry VII., was created Earl of Derby (1485) on Bosworth field. History records that he placed the crown of Richard on the head of the victorious Richmond. His son, Thomas, dropped the title of King, preferring "to be a great Lord to a petty King." James, seventh Earl, "the Great Earl of Derby," husband of Charlotte de la Tremouille, whose gallant defence of Lathom House is referred to in Peveril of the Peak, was taken prisoner after the battle of Worcester, and beheaded at Bolton-le-Moors in 1651. Notwithstanding the heroism of the Countess the Island was surrendered by treachery to the Parliamentary forces, and granted to Fairfax, who held it till the Restoration, when it was restored to Earl Charles.

Towards the end of the 17th century the Islanders, having no secure tenure of their lands, agriculture was neglected and they gave themselves up to fishing and contraband trade. This resulted in several years of scarcity and famine. In 1703 Bishop Wilson induced the then Earl (James) to grant "The Act of Settlement" (the Manx Magna Charta), by which leases were granted in perpetuity on payment of fines, &c. James, tenth and last Earl of the House of Stanley, died without issue in 1735. With him terminated the direct male line of the House of Derby, which had reigned over the Island upwards of 300 years. The Kingdom then passed through the female line to the Duke of Athole.

Attempts had been made, notably in 1726, by the English Government to purchase the Royalties of the Island, but without success. The contraband trade had risen to such a pitch as materially to affect the revenue of Great Britain. At length, in

1765, terms were come to with the Duke of Athole and his wife, Baroness Strange, and these terms are set forth in the Deed which Major Simpson's courtesy has enabled the Club to examine.

The Deed begins by reciting that—By Act of Parliament 12th of George the 1st to enable his Majesty to prevent the Fraudulent Trade then carried on between Great Britain and the Isle of Man "it was enacted that it might be lawful for the Crown and James then Earl of Derby John Lord Ashburnham for and on behalf of his daughter Henrietta Bridgett Ashburnham Bryan ffairfax Trustee for the said Infant to treat contract and agree for the absolute purchase or sale release or surrender of all or any Estate Right Title or Interest in or to the said Island or Lordship of Man in or to any Regalities Powers Honours Superiorities Jurisdictions Rights Privileges ·Duties Customs Revenues Profits or other advantages whatsoever in over or about the said Island of Man or its Dependencies" for such sum as should be agreed upon. "And whereas the most Noble James late Duke of Atholl Right Heir of James Lord Stanley on failure of Heirs male of the Body of William Earl of Derby by the death of the said James Earl of Derby became seized to him and his Heirs of the said Island Castle Peel and Lordship of Man and all other the premises aforesaid and whereas the said James Duke of Atholl departed this life on or about the 8th day of January 1764 leaving Charlotte (wife of John now Duke of Atholl) now Duchess of Atholl and Baroness Strange his daughter and only child" who thereupon became entitled to the said Isle "under and by virtue of a certain Indenture or Deed of Feeofment with Livery and seizin thereon indorsed and whereas a Treaty having been set on foot for the absolute purchase of their Estate and Interest in the said Island and Premises or such part thereof as should be found expedient to vest in His Majesty for the Public Service" they the said Duke and Duchess did by letter of 27th February 1765 enclose an Abstract of the clear Revenue of the Isle of Man for ten years (from 1754 to 1763) "and did declare that they were ready if it should be deemed necessary for the Public Service to part with all their Rights held under the several grants of the Isle of Man but apprehended that the Reservation of their Landed Revenue together with the patronage of the Bishoprick and other Ecclesiastical Benefices in the Island could not interfere with the interest of the Publick and presumed there could be no objection to their preserving the honourable distinction and service which their ancestors had so long enjoyed and by which they held their Rights in this Island of presenting the Two Falcons at the Coronation." They then go on to hope that £70,000 may not be too great a price to be paid to them in full compensation "reserving only their landed property with all their rights in and over the soil of Lords of the Manor with all Courts Baron Rents Services and other Incidents to such Courts belonging their Wasts Commons and other Lands Inland Waters Fisheries and Mills and all Mines Minerals and Quarries according to their present Rights therein Felons goods Deodands Waifs Estrays and Wrecks at Sea together with the Patronage of the Bishoprick and of the other Ecclesiastical Benefices in the said Island to which they were then Intitled to be holden of the Crown by the Honorable Service above mentioned." To this the Commons of Great Britain agree (7th March 1765) repeating at length the various privileges reserved by the House of Athole to be "holden of His Majesty his Heirs and Successors by the said Honorary Service of rendering to His Majesty's Heirs and Successors Kings and Queen's of England Two Falcons on the days of their respective Coronations and at and under the yearly Rent of £101 15s. 11d." This rent would appear to have been first charged in the reign ef James I. when fresh Letters Patent were granted to William, younger son of Henry, fourth Earl, on the death of his brother Ferdinand, with whose daughters William had effected a compromise for their claims over the Island.

The Deed is dated 7th March 1765, and signed on the one part Atholl, C. Atholl Strange, Charles Frederick, Edmund Hoskins—

and on the other George Grenville, North, Thomas Orby Hunter, James Harris.

The Atholes after a few years considered the compensation given inadequate. They thought the Government had "the fault of the Dutch, giving too little and asking too much." They appealed more than once and further sums (annuities) were granted. In 1825 an Act was passed to authorize the Lords of the Treasury to treat for the purchase of the Duke's remaining interest in the Island. The amount awarded by arbitration (in 1829) was £416,114, of which the Patronage of the Bishopric and the different Advowsons stood for £100,000. No valuation was put on the "honorable distinction and service of presenting the Two Falcons."

A curious anomaly having reference to the position of the Athole family was mentioned to me lately by a friend, viz.: that though Queen Victoria was debarred by the Salic Law from inheriting the Kingdom of Hanover, her subject, Sir Augustus D'Este, in the case of that Crown having fallen to his father the Duke of Sussex, would have been eligible to succeed him. His mother, Lady Augusta Murray, was a member of a Royal Family (of Man) and therefore there was, by German law, no bar to his succession, although by the Royal Marriage Act it was illegal in England.

BATH NATURAL HISTORY & ANTIQUARIAN FIELD CLUB.

INSTITUTED FEBRUARY 18th, 1855.

LIST OF MEMBERS FOR THE YEAR 1893.

PRESIDENT.

1855 *Rev. LEONARD BLOMEFIELD, M.A., F.L.S., F.G.S., 19, Belmont.

VICE-PRESIDENTS.

1861 *Rev. CANON ELLACOMBE, M.A., Bitton, Bristol.
,, *Rev. H. H. WINWOOD, M.A., F.G.S., 11, Cavendish Crescent.

CHAIRMAN.

1865 *H. D. SKRINE, Esq., M.A., D.L., J.P., Claverton Manor.

SECRETARY.

1872 *Rev. W. W. MARTIN, M.A., 49, Pulteney Street.

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1868 TAYLOR Col. R. L., C.B., 22, Gay Street.
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,, SKRINE Col. H. Mills, J.P., Warleigh.
,, BROWNE T., Esq., 1, Fountain Buildings.
,, FOXCROFT E. T. D., J.P., D.L., Hinton Charterhouse.
1880 DUCKWORTH Russell, Esq., J.P., The Cloisters, Perrymead.
,, CARLINGFORD Right Hon. Lord. The Priory, Chewton Mendip.
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,, WRIGHT Col. A. F. Bingham, Bathwick Hill.
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,, PIGOTT Lieut-Col. A., 7, Cavendish Crescent.
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,, GRAHAM Thos., Esq., 13, Kensington.
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,, BYROM Edmond, Esq., Bath and County Club.
,, HUTH Captain F. H., 20, Lansdown Crescent.
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,, STUBBS Rev. E. T., M.A., 4, Springfield Place.
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1889 ALEXANDER Patrick, Esq., Experimental Works, Bath.
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,, BALLY Major-Gen. W., 23, Park Street.
,, NIMMO Major-Gen. T. R., C.B., 94 Sydney Place.

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1890 FANSHAWE Col. T. B , 24, Park Street.
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,, THOMSON Urquhart G., Esq., Manvers House, Bradford-on-Avon.
,, *DAUBENY W., Esq., J.P., 1, Cavendish Crescent.
,, WEST Rev. W. H., M.A., 25, Pulteney Street.
,, ROSE H. F., Esq., 18, Grosvenor.
,, DAVIS Col. T. Arnoll, R.A., Lansdown Grove House.
1891 SEAGRAM Lieut.-Col. J. H. S., 4, Mount Beacon.
,, RICKETTS Col. Montague, Shelbourne Villa, Lansdown.
,, McCHEANE Rev. R., B.A., 5, Lansdown Place, E.
,, BLAIR Lieut.-Gen. C. R., 37, Green Park.
1892 PIGOTT W., Esq., 25, Circus.
,, BRAIKENRIDGE W. J., Esq., J.P., 16, Royal Crescent.
,, BRADFORD J. E. Goddard, Esq., 16, Marlborough Buildings.
,, BUSH Robert C., Esq , 1, Winifred's Dale.
,, BUSH Thomas S., Esq., Dale Cottage, Charlcombe.
,, DAVIDSON Major-Gen. James, 23, Queen Square.
,, PAVITT Thomas, Esq., 10, Cavendish Crescent.
,, PRYCE Ernest, Esq., 15, Belmont.
1893 BLAKENEY Edward, Esq., 44, S. James's Square.
,, HANDYSIDE W., Esq., 12, Dunsford Place.
,, WILLIAMS Rev. Philip, M.A., 15, Grosvenor.
,, BURMESTER Captain, Bitton, near Bristol.
,, BLATHWAYT Rev. Wynter Edw., M.A., Dyrham, Chippenham.
,, CASTELLAIN Alfred, Esq., 25, Queen Square.

* *Members of Committee of Management.*

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1864 DAWKINS Professor W. Boyd, F.R.S , F.G.S., &c., Owen's College, Manchester.
,, EARLE Rev. Prebendary, M.A., Swainswick Rectory, Bath.
1873 HERIOT Major-Gen. Mackay.
1878 BIRD H., Esq., M.D.

SUPERNUMERARY LIST.

1881 PHILP Capt. Francis Lamb.
1887 HEYWOOD Col.
1891 BLUNDELL J. Wagstaff, Esq.

RULES

OF THE

BATH NATURAL HISTORY AND ANTIQUARIAN FIELD CLUB.

1893.

1.—The Club shall be called "THE BATH NATURAL HISTORY AND ANTIQUARIAN FIELD CLUB," and shall consist (for the present) of not more than One Hundred Members.

2.—The object of the Club shall be to make Excursions around Bath, with the view of investigating the Natural History, Geology, and Antiquities of the neighbourhood.

3.—The Founder of the Club, the REV. LEONARD BLOMEFIELD, shall be considered the permanent *President;* and one or two Vice-Presidents, a Chairman, Secretary, Librarian and Treasurer, shall be chosen each year from among the Members at the Anniversary Meeting on the 18th February.

4.—The Committee shall consist of the past and present officers, and three other Members of the Club (the latter to be elected annually). whose business it shall be to consider and determine all matters connected with finance, and printing the Proceedings of the Club, or papers read at any of its meetings; or any business requiring consideration.

5.—Quarterly Meetings for the election of Members, and for other business, shall take place on the *First Tuesday* in April, July, October, and January.

6.—There shall be Four Excursions during the year, to be fixed at the Anniversary Meeting, *subject to alterations* at any previous Quarterly Meeting, if agreed to by all the Members present—six to form a quorum. A list of such Excursions, with the respective places of meeting shall be suspended in the Vestibule of the Bath Literary and Scientific Institution. Such Members as feel disposed shall also meet every *Tuesday*, at the Institution, at 10.30 a.m.

7.—The hour of meeting shall not be changed, except for the convenience of taking particular trains, when it is arranged to go by rail to any place; in which case the altered time shall be posted at the Institution not later than Twelve o'Clock on the Tuesday previous.

8.—In arranging the Excursions, due regard shall be paid to Natural History, Geology, and Antiquities, so as to secure an equal share of attention to each subject; with this view, when the same Excursion does not include them all, they shall, as far as practicable, be taken in turn.

9.—Special Meetings shall be appointed for the Reading of Papers or Exhibition of Specimens, notice being given to the Secretary at, or previous to, any one of the Quarterly Meetings, by Members having such communications to make to the Club.

10.—Gentlemen wishing to join the Club may be proposed and seconded by any two Members and will be elected by ballot at any of the meetings of the Club (three black balls to exclude), notice of their nomination being given in writing to the Secretary not less than fourteen days before any such Meeting. The Committee shall have the privilege of electing Four New Members during the year, provided there are vacancies.

11.—Any Member of the Club may invite a gentleman not resident in Bath to accompany him on the proposed Excursions, but when an offer of hospitality has been accepted by the Club, then only one visitor staying with a Member will be allowed to accompany him.

12.—The Secretary shall take Notes of the Excursions and read a Summary of the Year's Proceedings at the Anniversary Meeting; he shall also see that notices of all Excursions and Meetings are suspended at the Institution and posted to every Member at least seven days previously; such notices shall include the names of any candidates to be balloted for, together with those of their proposers and seconders.

13.—The Treasurer's audited accounts shall be examined and passed at the Anniversary Meeting.

14.—A Subscription of Ten Shillings shall be paid yearly by each Member, with an Entrance Fee of Five Shillings, to defray any expenses the Club may incur otherwise than by journeys and refreshments. This Subscription to be considered due on the Anniversary. Newly elected Members to pay the Subscription for the current year and the Entrance Fee at the time of their election.

15.—Members whose Subscriptions are in arrear for three months after Feb. 18th shall be considered as having withdrawn from the Club, if, after application, the same be not paid up.

16.—There shall be a Supernumerary List for Members whose absence from Bath does not exceed three years. Such Members, on their return, and on payment of their Subscription for the then current year, may be admitted to the Club at once, or as soon as a vacancy occurs.

17.—Members may borrow Books from the Club's Library, entering their names and title of the volume in a book kept by the Librarian for the purpose, but shall not retain them longer than one fortnight. Members of the Royal Institution can also read them on the premises, but not take them away. Members may also purchase back numbers of the Club's Proceedings at half-price.

WALTER W. MARTIN,

Hon. Sec.

The Honorary Treasurer in Account with "The Bath Natural History and Antiquarian Field Club," for the Year ending February 18th, 1893.

Dr.

	£	s.	d.
Balance in hand from last year	14	7	1
95 Subscriptions (including 3 in arrear from 1891) at 10s.	47	10	0
8 Entrance Fees at 5s.	2	0	0
Deposited in Post Office Savings Bank ...	46	0	0
Interest given upon same	1	2	9
By sale of Proceedings	2	2	3
	£113	2	1

Cr.

	£	s.	d.	£	s.	d
To Literary and Scientific Institution for use of room from 1st Jan., 1892, to 1st Jan., 1893 ...				5	0	0
Gratuities at Royal Institution and to Clerk for addressing Letters and Cards				1	2	6
Box for Secretary's Papers				0	5	9
Purchase of Petrological Microscope and Postage				24	19	0
Librarian's Bills for Binding				10	18	1
Donation to Glastonbury Excavation Fund ...				1	1	0
Gratuities at Excursions				4	8	10
Messrs. Lewis and Son's Account—						
Printing Proceedings and Postage				31	14	5
Cards, Circulars, &c.				6	3	4
Postage Expenses—						
Honorary Secretary	0	15	4			
,, Treasurer	0	10	1			
At Royal Institution	0	3	11	1	9	4
Balance in National Provincial Bank to Credit of the Field Club				25	19	10
				£113	2	1

J. T. CHANDLER, *Treasurer.*

Examined and found correct, 11th Feb., 1893,
R. L. TAYLOR.

SOCIETIES AND INSTITUTIONS TO WHICH THE PROCEEDINGS OF THE FIELD CLUB ARE ANNUALLY FORWARDED.

Bath Royal Literary and Scientific Institution.
Belfast Naturalists' Field Club.
Berwickshire Naturalists' Society.
Bristol Naturalists' Society.
British Association for the Advancement of Science.
British Museum.
    (1) Book Department. (Bloomsbury).
    (2) Natural History Department. (Cromwell Road).
Cardiff Natural History Society.
Christiania Royal Norwegian University.
Clifton Antiquarian Club.
Cotswold Naturalists' Society.
Geological Society.
Geologists' Association.
Glasgow Natural History Society.
Glasgow Philosophical Society.
Hertford Natural History Society.
Linnean Society.
Liverpool Literary and Philosophical Society.
Manchester Microscopical Society.
Norfolk and Norwich Naturalists' Society.
Nova-Scotian Institute of Science. (Halifax).
Reading Literary and Scientific Society.
Royal Archæological Institute of Great Britain and Ireland.
Smithsonian Institute, Washington, U.S.A.
Somersetshire Archæological and Natural History Society
Truro Royal Institution of Cornwall.
Warwickshire Natural History and Archæological Field Club.
Washington, United States Geological and Ethnographical Survey of Territories.
Watford Natural History Society.
Wiltshire Archæological and Natural History Society.
Yorkshire Philosophical Society.

CATALOGUE OF THE BOOKS
OF THE
BATH NATURAL HISTORY AND ANTIQUARIAN FIELD CLUB.

1892.

Alnwick Geology of. See Pamphlets. Vol. I.

Alert Cruise of, Coppinger. 1 Vol.

American Publications. See United States.

Anales dei Museo National Republico de Costa Rica. See South American Pamphlets.

Astronomical Society's Meeting, 1826. See Pamphlets, Vol. I.

Associated Architectural Society, 1869—75.
Vols. X, XI, XII, XIII, Part 1.

Archivos do Museo N. do Rio.
1 Vol. See South American Pamphlets.

Arctic and Antarctic Seas. Voyage of Discovery. 2 Vols.
R. McCormick, R.N.

Babington C. Flora Bathoniensis.

Ballast Flora Durham. See Pamphlets. Vol. I.

Ballarat School of Mines. See various societies. Vol. I.

Barrow Field Club, 1877, 78, 79. 1 Vol.

Barber E. Catalogue Collection of Tobacco Pipes. See Pamphlets, Vol. II.

Bath Natural History and Antiquarian Field Club.
Vol. I. to Vol. VII., Part 3, 1891-2.

Baxter Sylvester, Old New World. See Pamphlets. Vol. II.

Belfast Guide.

Belfast Naturalists' Society.
Vol. I (1863-5) to Series II Vol. III, Part 1, 1892.

Berington Rev. J. History of Henry II.

Berwick Natural History Society. Vol. I (1863—8), II, III, IV, V, VI, VII (incomplete), VIII, X, XII, XIII, Part 1.

Blackmore Museum. Account of Opening. 1 Vol.

Bristol Naturalists. Vol. I (1866), II, IV, V, VI, VII, Part 2.
New Series. Vol. I, 1874 to Vol. VII, Part 1, 1891-92.
Various Reports, from 1874 to 1891.

Brighton Aquarium Report. 1875.

British New Guinea. See Foreign and Colonial Pamphlets.

British Association Reports.
1886. Birmingham.
1887. Manchester.
1888. Bath.
1889. Newcastle.
1890. Leeds.
1891. Cardiff,
1892. Edinburgh.

Canada, Economic Minerals of. See various Pamphlets. Vol. II.

Cardiff Naturalists. Vol. I, 1867, to Vol. XXIV, Part 1, 1892.

Cardiff Flora. See Pamphlets. Vol. II. J. Storrie.

Catalog der Bibliothek des Vereims in Cassel, Germany.
See Pamphlets. Vol. II.

Clarke Hyde. Khita and Khita Peruvian Epoch. See Pamphlets. Vol. II.

Clifton Antiquarian Club. Vol. I, 1884-5, to Vol. II, Part 2, 1891.

Chedworth Roman Villa. Scarth. See Pamphlets. Vol. I.

Christiania University—

Sars Dr. George Ossian. Some Remarkable forms of Animal Life from the Great Deeps off the Norwegian Coast, II, 1875. See Norwegian Pamphlets. Vol. I.

Sars, Dr. G. Ossian. Carcinologiske Bidrag til Norges Fauna 1st Monograph over Mysider. 1st and 2nd part, 1870, 1872, also 1879. See Norwegian Pamphlets. Vol. 1.

Kjerulf, Dr. Theodor. Om Stratification Spor. 1877. See Norwegian Pamphlets. Vol. II.

Sexe S. A. Jœttigryder og Gamle Strandlinier i fast Klippe. 1874. See Norwegian Pamphlets. Vol. I.

Schübeler Dr. F. C. Die Pflanzenwelt Norwegens. 1873.

Siebke H. Enumeratio Insectorum Norvegicorum. 1874-80.

Holst Elling. Om Poncelets Betydning for Geometrien, 1878. See Norwegian Pamphlets. Vol. II.

Lieblein. Die Ægyptischen Denkmaler.
See Norwegian Pamphlets. Vol. III.

Hiordahl Th. Krystallographish Chemiske underogelser. 1881. Christiania. See Norwegian Pamphlets. Vol II.

Christiania University—

Bugge Sophus. Rune Inskriften paa Ringen I. Forsae. Kirk Christiania. 1877. See Norwegian Pamphlets. Vol. II.

Reusch Hans H. Silurfossiler og Pressede Konglomerater. Christiania. 1882. See Norwegian Pamphlets. Vol. II.

Festprogram. Kronprins Oscar og Kronprinsesse Marie. Christiania. September, 1881. See Norwegian Pamphlets. Vol. II.

Norges Officelle Statistik.
Christiania. 1872-3. See Norwegian Pamphlets. Vol. II.

Amden Beretning om Ladigaardsoens Hovedgaard.
See Norwegian Pamphlets. Vol. II.

Postola Sogur. Christiania. 1874.

Schive C. J. Om Forboldet i Middelalderen millem den norske Mark. See Norwegian Pamphlets. Vol. III.

Bredo Morgenstierne. Om et Fund af 19 Mynter fra Harald Haardraade paa Gaarden Thjore i Haarlands Præsteg jold paa Jœderem. See Norwegian Pamphlets. Vol. III.

Schneider J. Sparre. Indberetning om en i Sommeren. 1876. foutagen lepidopterologisk Reise. See Norwegian Pamphlets. Vol. III.

Church Rambler. 2 Vols.

Coppinger, Cruise of Alert.

Cornwall Journal Royal Institution. Vol. IV (1871) to Vol. XI, Part 1, 1892, and various Annual Reports.

Costa Rica Informe Presentado do Instruccion.

——— Instituto Fisico Geographus y del Musco Nacional.

Cotteswold Field Club Proceedings.
Vol. IV (1868) to Vol. X, Part 1, 1890.

Cotteswold Field Club, Origin of. See Vol. 1886—9. W. C. Lucy

Coues Dr. E. See U.S. Geological and Geographical Surveys.

Dolmens in Japan. 1880. See Pamphlets on Japan. Ed. Morse

Drybrook Section Forest of Dean. See Pamphlets. Vol. I.
J. Jones & W. C. Lucy

Dulwich College Science Society. See various societies. Vol. I.

Dumfriesshire and Galloway Natural History Society.
1863-4. See Scotch societies.
——— 1892.

East Indian Association. See Foreign and Colonial Pamphlets.

Ealing Microscopical Society. 1880, 1881, 1882.

——— 5. An Conversatiorie. 1882. See various societies. Vol. IV.

Earth History of Remote Past. See Pamphlets. Vol. I. J. E. Marr

Edinburgh Botanical Society.
President's Address. See various societies. Vol. II.

Elephant Pipes. See Pamphlets. Vol. II. C. Putnam

Enumeratio Insectorum Norvegicorum. H. Siebke

English Sparrow in North America.

Fisher. Withered Leaves. See Pamphlets. Vol. I.

Flint Chips. Edward J. Stephens

Flora Bathoniensis. See Babington.

Flora of Cardiff. See Pamphlets. Vol. II. J. Storrie

Flora fossil Review of North America. See U.S. Geological and Geographical Survey. Various Publications. Vol. I.

Flowering Plants of Wilts. Preston.

Garner The. 1885. See Scientific Pamphlets.

Gesta Romanorum. Rev. C. Swan

Geologists' Association. 1870, 1892. Vol. II (1870), III, IV, V, VI, VII (incomplete), VIII, IX, X, XI, XII, XIII, Part 1.

Glasgow Natural History Proceedings.
Vol. I (1858) to Vol. III (N.S.), Part 1, 2, 3.

Glasgow Philosophical Proceedings. 1865, 1892.
Vol. VI—XI to XXIII, and Index Vol. I to XX.

——— **Geological Society.** 1888.

Grevillea C. Massee.
Quarterly Record of Cryptogamic Botany. Vol. XXI. 1892.

Hampshire Field Club. 1888. See various societies. Vol. III.

Handbook of Victoria Australia.

Hein Prof. On formation of Mountains. See Pamphlets. Vol. I.

Hertford Natural History Society. Vol. I, III, IV, V, VI (incomplete), Vol. VII (1892), Parts 1, 2, 3, 4.

Henry II. History of. Rev. J. Berington

Highland Agricultural Society. See Scotch societies.

Holmsdale Natural History Club. Proceedings. 1888, 1889.

Hughes Thomas McKenny, Perched Blocks and Associated Phenomena. Geology of Anglesea. Vale of Clywd. See Pamphlets. Vol. I.

Humbolt's Cosmos 2 Vols.

Indian and Colonial Exhibition.
Minerals of Canada. See Foreign and Colonial Pamphlets.

Japan, Pamphlets on. E. Morse

——— Traces of an Early Race. See Pamphlets on Japan.

Journal Statistical Society.

——— of Travel and Natural History. 1888, 1889.
See various societies. Vol. III.

Jones J. & W. C. Lucy. Drybrook Section. See Pamphlets. Vol. I.

Kent's Cavern Exploration. See Pamphlets. Vol. I.

Khita and Khita Peruvian Epoch. See Pamphlets. Vol. II.
Hyde Clarke

Lead Bearing Strata of North of England. Pamphlets. Vol. I.
John Morris

Lichen Flora of Great Britain. Rev. W. H. Leighton

Leeds Geological Society. 1878.
——— **Naturalists' Club.** 1875, 1876, 1877
——— **Constitution**
See various societies, Vol. III.

Lucy W. C. Origin of Cotteswold Club.

Lucy & Jones. Drybrook Section. Pamphlets. Vol. I.

Liverpool Literary and Philosophical Society. Vol. XXVII, 1872 to Vol. XLIII, 1888, 1889. Vol. 39 and 40 missing.

Malvern Natural History Club. 1870. See various societies. Vol. III.

Marr J. E. Earth History of Remote Past. See Pamphlets. Vol. I.

Massee C. Grevillea.

Megalithic Remains of Stanton Drew. See Pamphlets. Vol. I. Scarth.

Manchester Scientific Students. 1 Vol. 1878, 1889.
——— Microscopical Society. 1886, 1887, 1888, 1889, 1890, 1891.

Microscopical Society Journal. See various societies. Vol. IV.

Marlborough College. Natural History Report, 1889. See various societies. Vol. I.

Memoirs of Wm. Smith. J. Phillips

Morse Prof. E. Traces of an Early Race in Japan. Dolmens in Japan, 1880.

Omori Shell Mounds. See Pamphlets on Japan.

Morris John. Lead Bearing Strata, North of England. See Pamphlets. Vol. I.

Monthly Report of Dep. Com. of Revenue.

McCormick. Voyage of Discovery. 2 Vols. Arctic and Antarctic Seas.

Murchison R. J. Address Royal Geographical Society. 1844, 1861. See various societies. Vol. II.

Museum. May, June, July, August, 1885. See Scientific Pamphlets.

Naturalists' Practical. July, 1883. See Scientific Pamphlets.
——— Note Book. March and April, 1888. See Scientific Pamphlets.
——— Circular. September and July, 1867. See Scientific Pamphlets.

Natural Science. April, 1892.

New Rocky Mountain Tourist. See Foreign and Colonial Pamphlets.

Norfolk and Norwich Naturalists' Society. Vol. III (1879—1884), Vols. IV, V, Parts 1, 2.

Norwich Geological Society.
Proceedings. 1877, 1878. See various societies. Vol. III.
Old New World. See Pamphlets. Vol. II. S. Baxter
——— **Omori Shell Mounds.** See Pamphlets on Japan. E. Morse
Osborne H. F. Review of Cernaysian Mammalia. See Pamphlets. Vol. II.
Palæontological Society. 7 Vols. XL to XLVI.
Perforated Stones of California. See Smithsonian Pamphlets.
Phillips John, F.R.S. Memoirs of Wm. Smith.
Putnam C. Elephant Pipes. Pamphlets. Vol. II.
Postola Sogur.
Preston. Flowering Plants of Wilts.
Reading Literary Society. Proceedings. 1892.
Rhætic Sections in Warwickshire. See Pamphlets. Vol. I.
Rocky Mountain Tourist. See Foreign and Colonial Pamphlets.
Rome, British Archæological Society of. See Pamphlets. Vol. I.
Roman Villa at Chedworth. Pamphlets. Vol. I. Scarth.
Royal Geographical Society. 1861, 1844. See various societies. Vol. II.
Scarth Rev. H. M. Roman Villa at Chedworth. 1869. } See Pamphlets. Vol. I.
——— Sculptures West Front Wells Cathedral. }
——— Megalithic Remains Stanton Drew. }

1. On the Roman Miliaries found in Britain.
2. Roman Maritime Towns in Kent.
3. On an Inscribed Votine Tablet found at Binchester (the Ancient Vivonium) Co., Durham, in 1879.
4. On the Roman Occupation of the West of England, particularly the County of Somerset.
5. Recent Discoveries made in Bath on the site of the Ancient Roman Baths.
6. Notices of the latest Discoveries made in uncovering the Roman Baths at Bath, and those at Herbord, near Poictiers.
7. Recent Discoveries made at Aquincum, in Hungary.
8. Roman Inscribed Stones at Rookwood, near Llandaff.
9. A few Remarks on Roman Cookery.
10. Font at Hinton Parva, Wiltshire.
11. Roman Villa at Wemberham, in Yatton, and Discovery of Roman Coins, near Kingston Seymour.
12. On an Ancient Botontinus or Landmark on Banwell Hill.
13. Visit of Royal Archæological Institute to Castle Neroche.

(See Scarth's Pamphlets)

Scientific Roll. 1880, 1883.

Sheffield Archæological Society.
Reports, &c. See various societies. Vol. I.
—— Philosophical Society. See various societies. Vol. I.
Smith William by J. Phillips
Somerset Archæological and Natural History Society. Vol. I (1850) to Vol. XXXVIII and Index Vol. I to XX.
Sparrow English in North America.
Stockport Society of Naturalists.
1887, 1888. See various societies. Vol. II.
Surrey Archæological Society Rules, &c. See various societies. Vol. I.
Tobacco Pipes, Collection of Elephant. See Pamphlets. Vol. II.
E. Barber.
Traces of Early Race in Japan. See Pamphlets on Japan. Morse
Trenton Natural History and Field Club.
Tolstoi Leon. "What I believe."
United States—
American Journal. 1860. See Pamphlets. Vol. II.
Bureau of Ethnology. Annual Reports. 7 Vols 1879, 1885.
Bulletin National Museum. 4 Vols. 1875, 1887, 1889, 1890, 1891.
English Sparrow in North America.
Journal Trenton Society. 1889.
North American Fauna.
Peabody Museum, &c. 1 Vol. 1882, 1885.
United States Geological Survey of the Territories.
F. W. Hayden, Geologist, in charge.
Vol. I. Leidy J. Extinct Vertebrate Fauna.
,, II. Cope E. D. 1875. Cretaceous Vertebrata.
,, V. Cyrus Thomas. Acrididæ of North America.
,, VI. Lesquereux Cretaceous Flora.
,, VII. ——— Tertiary Flora.
,, IX. Meek F. B. Invertebrate Palæontology.
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